TEST MANAGEMENT PHASE PLANNING GUIDE

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USAF TEST PILOT SCHOOL
EDWARDS AIR FORCE BASE, CALIFORNIA

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SECTION I
INTRODUCTION

Welcome to the Test Management Phase! In this phase you will be introduced to the fundamental theory, application and test management considerations used to design, build and evaluate current flight systems. You'll get to integrate previously gained knowledge and flying skills with test management practices, and then use these new skills to conduct a variety of flight test projects. This phase spans the entire TPS curriculum. Initially, it involves only reporting techniques; but eventually it adds the planning and execution of flight test. Primarily, you'll be involved in the Qualitative Evaluation Program and a Test Management Project.

In the Qualitative Evaluation Program, you'll get to evaluate a wide variety of aircraft. These evaluations are designed to broaden your experience base and allow you to apply your newly acquired flight test skills.

In your Test Management Project, you'll be responsible for the complete test cycle, from initial planning through reporting. The focus here is to develop the ingenuity, as well as the technical research, managerial, and communication skills you need for a successful test project. In many ways, the Test Management Project is a culmination of your entire TPS experience.

ACADEMICS:
The test management academic curriculum includes courses in test planning, test safety, test instrumentation, test conduct, data analysis, and reporting test results. It ensures you have knowledge of the theory and techniques necessary to manage and conduct a flight test project.

FLYING:
The Test Management phase flying curriculum provides demonstration and instruction in how to perform an aircraft qualitative evaluation, as well as conduct your test management project. First, you will complete a qualitative evaluation in the A-37B or F-16. Then qualitative evaluations are flown in a large variety of aircraft. Also, you will be assigned to a qualitative evaluation group with the task of evaluating a specific aircraft. Each group will write a qualitative evaluation test plan and present an oral report. Finally, additional flying is done in your project aircraft during the test management project phase. Each student test pilot will fly data

sorties in the test project aircraft. Student navigators and engineers will fly in support of the test projects as much as possible.

Overall, the Test Management Phase contains some of the most enjoyable flying in the TPS curriculum. You will have the unique opportunity to fly a large variety of aircraft and mission profiles. Enjoy it! Your greatest effort during this phase should be directed toward insuring that you are prepared for each flight. If you are not fully prepared, take yourself off the flying schedule. Your learning during this phase will be directly related to the amount of effort you put into it.

REPORTS:

Section III of this guide contains the various report requirements associated with your TPS experience.

SECTION II
OBJECTIVES AND RULES OF ENGAGEMENT

OBJECTIVES:

At the completion of the Test Management Phase curriculum you will be able to:

1. Analyze general customer objectives and available resources to synthesize a technically sound, minimum risk, executable test plan with specific objectives.

2. Apply sound flight test management methods to the conduct of a test project.

3. Evaluate test results, draw logical conclusions and make meaningful recommendations.

4. Apply industry standard reporting formats to clearly communicate results.

LIMITATIONS:

1. In the academic environment, edge-of-envelope testing is not required. The student test pilot/engineer will learn the concepts, test techniques, and mission application while testing in the heart of the envelope. In general, test programs employ buildup techniques before attempting flights in a critical area.

2. All Technical Order limitations and restrictions, as well as Service, MAJCOM, and Unit regulations will be followed. (Exception: An approved test plan which has specifically identified the point as outside T.O. limits.)

3. The test plans for each test management project or qual group aircraft contain specific limitations, flight test envelopes, and test points. All test points flown by the student test pilot/engineer will be selected from those listed in the test plans.

4. Qualitative evaluations or test projects requiring the use of an airborne target should follow test plan restrictions.

5. For low level navigation routes, fly no lower then 500 ft AGL. Refer to AFFTCR 55-2 for guidance on low level flying in R-2508 or to applicable local regulations for other locations.

6. For use of ground targets refer to AFFTCR 55-2 at Edwards or to applicable local regulations at other locations.

7. Maneuver restrictions:

a. Qual flight profiles will be constructed to explore the performance and handling qualities of the aircraft within its operational flight envelope. Maneuvers will be mission related and will not exceed operationally representative airspeeds and G loadings.

b. Operational maneuvers which are limited by MAJCOM or a service branch to "highly experienced aircrews" will not be flown by TPS students, but may be demonstrated by the qual eval aircraft IP.

c. All qual eval aircraft test points, to include flight test techniques and operationally significant maneuvers, will be limited to 90 percent of the aircraft G limit and 95 percent of the aircraft airspeed and Mach limit.

d. No flight test techniques will be performed below 5000 ft AGL.

e. A minimum of 500 ft AGL will be maintained for all in-flight operations except for tower flyby and traffic pattern operations.

f. No formation takeoffs or landings will be accomplished.

g. No BFM/ACBT! Structured air-to-air tracking tasks may be accomplished; however, don't push your luck.

8. For dual place aircraft an IP current in the aircraft will be at one set of controls. (For A-6 flights, an IP who is current in the aircraft occupying the right seat is satisfactory.) For engineer/navigator (back seat/ right seat) flights, an IP is desired so the student may be allowed to fly when up and away; FTE/FTNs are not authorized to be on the controls during takeoffs and landings (below 300 ft), formation flying, or aerial refueling. If an IP is not available, the flight may still be flown with an aircraft commander current in the aircraft; however, the student will not be allowed to fly.

TRAINING:

1. For dual place aircraft, the qual aircraft ground school, briefed by a qual aircraft instructor, will cover all systems essential to flight. A minimum of one hour cockpit time, or one hour simulator time (if available) will be accomplished. The preflight briefing will include all applicable normal and emergency in-flight procedures.

2. For single place aircraft:

a. A minimum of eight hours of ground school on all systems essential to flight will be covered. A minimum of one hour cockpit time, or one hour simulator time (if available) will be accomplished. Open book, closed book and bold face emergency exams, as applicable, will be completed satisfactorily. Primary emphasis will be placed on study of the Flight Manual, especially emergency procedures. The students

will satisfactorily demonstrate aircraft knowledge prior to flight. IPs may use any means they desire, including written exams, to determine if the student is prepared. The preflight briefing will include all applicable normal and emergency in-flight procedures.

b. All training will be conducted within 30 days prior to the flight. If 30 days between start of ground school and the date of the flight have been exceeded, the student must attend a refresher course (minimum of two hours) that includes aircraft systems, normal operating procedures and emergency operating procedures. The student will also receive at least one hour of additional cockpit time and reaccomplish the bold face emergency exam.

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SECTION III
TPS REPORTS REQUIREMENTS

The mission of any flight test organization is to test and evaluate aerospace systems and report the results of those tests. The final step in meeting these objectives--the writing of the technical report--is a vital task. It plays an important role in the decision-making process of major weapon systems acquisition. Thus it is imperative that our technical reports be clearly written, accurate, precise and adhere to established guidelines. We are often tasked to present our test results in a briefing. Therefore, we must also be able to communicate orally the essence of a technical report in a concise manner.

Technical reporting of test results is an essential part of the USAF Test Pilot School (TPS) curriculum. Your effectiveness as test pilots, flight test engineers, and flight test navigators will ultimately be measured by your ability to communicate technical information to designers, contractors, test teams, and project managers. In this regard, flight test personnel enjoy a very privileged position. Your first-hand experience places you in a special position to recommend approval or disapproval of important military systems. Some of your reports may even appear in court during contract disputes. To have the greatest impact, you must clearly and concisely provide accurate, unbiased information.

Students must learn to communicate important test results in written and oral formats. The TPS Reports Program develops your ability to meet these objectives. Test Pilot School uses the format of the Air Force Flight Test Center (AFFTC) Technical Report. We do this because the majority of TPS graduates remain at the AFFTC and will eventually prepare an AFFTC technical report. However, students reporting for duty to other flight test organizations will adapt quickly to slight format variations since the fundamentals of technical reporting do not change from unit to unit.

Proper analysis and communication are the emphasis of the reports program. Format is secondary. Wherever or for whomever you write a report, you will be given ample formatting assistance. The following guidelines are for preparing TPS technical reports which present the results of your flight test evaluations. Additional guidance is presented in The Author's Guide to Writing AFFTC Technical Reports. Students

will use these documents to prepare all reports at the USAF TPS. Staff instructors will use them to evaluate all student reports.

Reporting is one of five steps in the TPS learning process. These five steps are:

1. Learn theory in the classroom.

2. Learn the Flight Test Techniques (FTTs) through classroom instruction.

3. Pilots practice the FTTs with an instructor pilot on demonstration flights. Flight test engineers (FTEs) and flight test navigators (FTNs) observe the FTTs on familiarization flights with instructors and on practice and data mission sorties with pilot classmates.

4. Gather the data on test missions.

5. Communicate the results in a report.

There are four major divisions in the TPS curriculum: performance, flying qualities, systems, and test management. A number of reports and documents are required in each phase, and you'll be required to submit these reports according to the specific instructions provided in this chapter.

The two basic types of reports, written and oral, are submitted as both group and individual efforts at the TPS. The following breakdown briefly describes each type of report.

1. Group Final Written reports are typewritten and present the results of a limited test and evaluation. They follow the general format of an Air Force Flight Test Center (AFFTC) Technical Report (TR).

2. Individual Interim Written reports present the interim results of a limited test and evaluation; they usually present the results from a single sortie.

3. Individual Daily Written reports have the simplest and most informal format. They document the results of a single flight and are completed immediately after post-flight debriefing. These are usually handwritten reports, but may be typewritten if the student desires.

4. Technical Letter reports (TLRs) present "quick look" results of a flight test and evaluation, and are typewritten.

5. Individual Daily Oral reports are used to debrief checkrides one-on-one with an instructor. They require no visual aids, and are conducted in conjunction with the submission of a Daily Written report.

6. Informal Oral reports are presented in flight suits and require visual aids.

7. Formal Oral reports are presented in service dress uniform and require visual aids. All formal orals will be given in the Preliminary Report of Results (PR^2) format as defined in The Author's Guide to Writing AFFTC Technical Reports.

8. Test Concept letters, presented in current AFFTC format, provide the concept of the test, the test schedule, and various resource requirements.

9. Test Plans contain enough information to develop flight cards and manage a test. They are presented within current AFFTC guidelines.

You'll have the opportunity to practice each type of report at least once. The required reports and documents appear in Tables 3.1 through 3.4.

Included within most of your reports and documents will be numerous plots and tables. Data plots (including strip charts) and tables should always stand alone. All information necessary to understand what is pictured should be included and not implied. The Author's Guide to Writing AFFTC Tech Reports, includes detailed guidance as well as many samples of these report elements. Additional guidance is in your Data Analysis and Presentation classes. Also, the Chief of Reports is available for more detailed information.

Additionally included in most of your reports will be hand calculations. Each student within a data group will reduce a different point and that point will be represented on the required plots. You may do the calculations by hand, computer algorithm or spread sheet. However, if you chose a computer method you must provide a print out of the computer program or the programmed cells of the spreadsheet.

Table 3.1
PERFORMANCE REPORTS

Air Data System Calibration	Group Technical Letter Report	Pass/Fail
Maneuver Performance	Individual Technical Letter Report	Graded
Lift/Drag Characteristics	Individual Interim Written (without Intro Section)	Pass/Fail
Cruise Performance	Individual Interim Written	Graded
Performance Final Check Ride	Individual Daily Oral (Debrief)	Graded
	Individual Daily Written (FTE/N)	Graded
Limited Performance Evaluation	Group Final Written	Graded

Table 3.2 FLYING QUALITIES REPORTS		
Model Identification	Individual Daily Written	Pass/Fail
Longitudinal Static Stability and Maneuvering Flight	Individual Interim Written	Graded
Lateral Directional Stability	Individual Formal Oral	Pass/Fail
Engine Out	Group Technical Letter Report	Graded
Dynamics and Operational Handling	Individual Interim Written	Graded
FTE/N Flying Qualities Checkride	Individual Daily Written and Oral (Debrief) (FTE/N)	Graded
Flying Qualities Oral	Group Formal Oral	Graded
F-16 Deep Stall	Individual Daily Written (Pilots)	Pass/Fail

Table 3.3 SYSTEMS REPORTS		
Human Factors Cockpit Eval	Individual Daily Written	Pass/Fail
Pilot's Systems Eval Checkride	Individual Technical Letter Report (Pilots)	Graded
ASTTA Exercise	As Required by Hand-out	Pass/Fail
Captive Compatibility/ Asymmetric Stores	Individual Daily Written (Pilots)	Pass/Fail
FTN Systems Eval Checkride	Individual Technical Letter Report (FTNs)	Graded

Table 3.4 TEST MANAGEMENT REPORTS		
Qual Eval Test Plan	Group Test Plan	Graded
Qual Eval Report	Group Informal Oral	Pass/Fail
A-37/F-16 Qualitative Evaluation Demonstration	Individual Daily Written	Pass/Fail
Single Look Qualitative Evaluation	Individual Daily Written	Pass/Fail
TEST MANAGEMENT PROJECT		
Test Concept	Group Test Concept	Pass/Fail
Test Plan	Group Test Plan	Graded
Project Folder	---	Pass/Fail
Test Plan Working Group	Group Informal Oral	Pass/Fail
TRB/SRB	Informal Group Oral	Graded
Safety Review Approval Pkg	---	Pass/Fail
Data Management Folder	Group Informal Oral	Pass/Fail
Program Assessment Review	Group Informal Oral	Pass/Fail
Pre-Writers Meeting	Group Informal Oral	Pass/Fail
Technical Coordination Meeting	Group Informal Oral	Pass/Fail
Test Management Report	Group Final Written/Group Oral	Graded

REPORT DUE DATES:

Reports are due by 1700 on the due date and late any time thereafter. For each day the report is late, you may lose up to one point from the overall score. If the report exceeds one week late, you may be placed on academic probation (TPS OI 53-3) at the discretion of the Director of Student Training.

Due dates depend on the type of report submitted. We'll determine the due date this way:

1. The guidance for each report will designate the number of duty days allotted to complete the report. Most interim reports fall due five working days after the last data flight.

2. The day you fly your data mission for the report doesn't count as one of the allotted duty days.

3. You're not required to turn in your next individual report until two duty days after your last individual report was returned to you. Pass/fail reports are returned as each is graded. Graded reports are given back as a class. To allow you the opportunity to turn in your next report sooner, and benefit from instructor feedback, you may review your graded report with the grader and turn in your next report any time up to the original due date.

Many factors can render the above plan unreasonable. The Chief of Reports or the Director of Student Training can extend due dates for unusual circumstances. Make sure you bring potential problems to their attention as soon as possible, and have the new due dates documented.

Situations can arise that require the guidance for a report to change. If guidance changes after you've generated a hard copy of the text, plots, etc., don't change it unless you have the time. A stapled message on the cover of the report explaining the problem will suffice.

The TPS staff will grade your reports. The Chief of Reports will maintain a list of the graders for all reports. Individual reports will have one grader and group reports will have three or more graders. Submit one copy of each report for each grader to the Chief of Reports for distribution to the assigned graders.

RULES OF ENGAGEMENT:

The purpose of the TPS Reports Program is to ensure that each student learns to communicate test results, conclusions and recommendations clearly and accurately using established guidelines. Maximum learning occurs when each student or group of students does their own work. Follow these rules:

1. Do your own work.

2. Don't read other students' or groups' ungraded reports. You may read published reports from previous classes. Copies of these reports can be found in the TPS Library.

3. Don't plagiarize. This includes, but is not limited to, past TPS reports, flight manuals and reference material.

4. Don't submit any material from past classes or your classmates as your own.

Violation of any rule listed above is grounds for academic probation or elimination from the Test Pilot School. (See USAFTPS OI 53-3).

These rules ensure everyone does their own work. Discussion among yourselves is an important part of the learning process and is encouraged. However, when you sit down to do your work, make it your own! Direct any questions about what's acceptable to the Chief of Reports or Director of Student Training.

WRITTEN REPORT FORMATS

GENERAL:

The Test Pilot School uses four formats for written reports: final, interim, daily, and Technical Letter Report (TLR).

FINAL WRITTEN REPORT:

General: The TPS Final Report closely follows the format of an AFFTC Technical Report (TR), and presents the results of a limited evaluation. An example of such a report is the Performance Final Report. It contains the major sections presented in The Author's Guide to Writing AFFTC Technical Reports with the following exceptions:

1. In the Introduction, combine the general, historical background, and program chronology into one section called background.

2. In the Test and Evaluation, there is no need to repeat a test item description, as you should have made it specific in your introduction.

3. No distribution list is required.

INTERIM WRITTEN REPORT

The TPS Interim Report is an abbreviated version of the Final Written Report, and is designed to present the results of a small portion of an overall evaluation. It may present the results of only one flight. The Interim Report follows this format:

1. Cover Page

2. Introduction (Same sub-headings as Final Written Report)

3. Test and Evaluation (Same sub-headings as Final Written Report)

4. Conclusions and Recommendations

5. References

6. Appendices

The format for each section, with the exception of the Cover Page, is the same as for the Final Written Report. The cover page, on plain white paper, should include the report title, your name and title and the date of the report. Examples include the Cruise Report and the Dynamics and Operational Handling Report.

DAILY WRITTEN REPORT

The TPS Daily Report documents your initial impressions of your recently completed test mission. In a test program that requires more than one sortie, the Daily Reports form an historical record of your progress and results, and eventually contain much of the data for the interim or final report. It's an informal means of documenting the test for yourself, and is a means of communicating with other members of your test team, contractors and the SPO. Here at TPS, we use the daily written report as a basis for you to report on single mission evaluations like the FTE/N Flying Qualities Final Checkride and the Single Look Qualitative Evaluations. Keep this report brief and to the point.

The TPS Daily Written Report has this format:

1. Daily/Initial Flight Test Report (AFSC Form 5314): Complete this form during the post-flight debrief if possible, and do not leave any sections blank (e.g., if something is not applicable, mark it N/A). Sections one, two, and three are self-explanatory. In section four, put the purpose of the test mission, as well as the test method and conditions. Section five, Results of Tests, presents your initial impression of how the flight went. Comment on test techniques, data collection, data quality, initial impression of test results, and anything you want to remember about the flight. Section six contains recommendations to yourself and the test team about better ways to conduct the test, what needs repeated, what needs fixed, and what to do next.

2. Analysis, Conclusions and Recommendations: Complete this section after you've done some engineering analysis of the data. Include information you'll need to develop the Results and Analysis in the Test and Evaluation section of an Interim or Final report. In relation to the test objectives discuss the data, analyze it, form conclusions, and recommend action. Ideally, very little work should be required to get this information into a useable form for an Interim or Final report. However, unlike a Interim or Final report, it's appropriate to make conclusions and recommendations to yourself and the test team regarding test methods, data analysis techniques, or instrumentation.

3. Test Data Plots: This section contains the supporting data for your results and conclusions. Hand drawn plots are acceptable; be sure to include all necessary information on the plot so someone else on the test program can use it.

TECHNICAL LETTER REPORT

Here at the USAF Test Pilot School, you will write many Technical Letter Reports (TLR). The Author's Guide to Writing AFFTC Technical Reports says it best, "Normally, these are a quick-reaction, abbreviated report of final test results. It usually contains many of the report elements found in a formal technical report; however, the amount of detail in each element is much reduced. Nonetheless all the care that goes into writing a technical report applies here. Clarity, accuracy and good writing techniques are just as necessary here as for a technical report, maybe more so, since this is merely a shortened version of a technical report."

Use the format from The Authors Guide to Writing AFFTC Technical Reports for your Technical Letter Report.

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ORAL REPORT FORMATS

FORMAL ORAL

Wear the service dress uniform, or equivalent, for formal orals. Tongue and Quill provides guidance for these briefings on pages 77 to 112. Also, The Author's Guide to Writing AFFTC Technical Reports provides briefing guidance. All formal orals will be given in the Preliminary Report of Results (PR^2) format as defined in The Author's Guide to Writing AFFTC Technical Reports. The report requirements section of this chapter specifies the quality of the visual aids (handwritten or typed) and the length of each briefing.

INFORMAL ORAL

Informal orals are conducted in flight suits, require visual aids, and are presented by both groups and individuals. Except for the Program Assessment Review and the Technical Review Board/Safety Review Board, there is no specific format for these briefings. The briefings should contain the same information presented in written reports.

DAILY ORAL

Daily oral reports are used to present results from checkrides, and are presented one-on-one with an instructor. Present the daily oral report in conjunction with the submission of a daily written report. Visual aids aren't required, but use the tables and graphs in your daily written report to support your briefing. There are no specific guidelines for the content or style; however, the report should tell the audience why you did the test, how you did it, and what you determined.

REPORT REQUIREMENTS

The following pages describe the reports required to complete the USAF Test Pilot School curriculum.

PERFORMANCE REPORTS

REPORT TITLE	TYPE	PAGE #
Air Data System Calibration	Group Technical Letter Report	3.15
Maneuver Performance	Individual Technical Letter Report	3.17
Lift/Drag Characteristics	Individual Interim Written (without Intro section)	3.19
Cruise Performance	Individual Interim Written	3.21
Performance Final Check Ride	Individual Daily Oral (Debrief)	3.23
	Individual Daily Written (FTE/N)	3.23
Limited Performance Evaluation	Group Final Written	3.25

AIR DATA SYSTEM CALIBRATION REPORT

REFERENCES:

1. Performance Phase Planning Guide.
2. The Author's Guide to Writing AFFTC Technical Reports.
3. Performance Phase Textbook, Chapter 5, "Pitot Statics and the Star Atmosphere."
4. Aircraft Flight Manual.
5. MIL-P26292C (USAF), Pitot and Static Pressure System, Installation Inspection Of.
6. Herrington, Russel M., Flight Test Engineering Handbook, AF Technical Re No 6273, AFFTC, Edwards AFB CA, January 1966.

PURPOSE:

To present the results of your air data system calibration flight testing.

TYPE OF REPORT:

Group Technical Letter Report

SCENARIO:

A contractor has delivered a new aircraft to the Flight Test Center to star performance and flying qualities testing. The first test is to calibrate the aircraft ai data system. You have been given instrument corrections for both the front cockpit gauges and the transducers of the newly installed data acquisition system (DAS). This leaves you with determining the aircraft static position errors and temperature probe recovery factor and bias to complete the air data system calibration.

OBJECTIVE:

As per your test plan.

ADMINISTRATIVE ITEMS:

1. Type the report (double space).

2. The report is due seven working days after the last data flight of your group.

3. Submit three copies of your report to the Chief of Reports. The test team director for each group should retain the original. Use a TPS blue cover for the original copy.

4. Each group's report will be debriefed by three staff members. The debriefing will consist of a 1.5 hour critique/question and answer session.

5. This is a pass/fail report; the report grade will be for the entire group. However, one individual showing either more knowledge or less initiative will be rewarded

accordingly. In other words, everyone should be involved in all phases of the report, from the data taking to the final debriefing.

REQUIREMENTS:

1. The report will include the results and analysis for the Tower Flyby, Pacer, and Radar missions flown by each student test team. The analysis is a very important part of this report.

2. Each student will hand reduce one Tower Flyby and Pacer point. The calculations will be handed in separately but at the same time as the report. Students within the same data group will hand reduce different data points.

3. Include applicable AFSC 5314s as an attachment.

4. Include all required plots as identified in your test plan. Only the most important plots should be in the results and analysis sub section. All others should be included in attachments.

MANEUVER PERFORMANCE REPORT

REFERENCES:

1. Performance Phase Planning Guide.
2. The Author's Guide to Writing AFFTC Technical Reports.
3. Performance Phase Textbook, Chapter 9 "Energy Concepts."
4. Herrington, Russel M., Flight Test Engineering Handbook, AF Technical Report No 6273, AFFTC, Edwards AFB CA, January 1966.

PURPOSE:

To present the results of your limited maneuver performance testing.

TYPE OF REPORT:

Individual Technical Letter Report.

SCENARIO:

You are on a test team conducting performance evaluations of a new aircraft. The Test Director wants an interim report on the aircraft's maneuver performance. You are to perform level acceleration, sawtooth climb and turn performance test flights to collect all needed data.

OBJECTIVE:

As per your test plan.

ADMINISTRATIVE ITEMS:

1. This report may be handwritten.

2. This is a graded report and all reports will be graded prior to the return of any of them. You may debrief the report with the grader prior to getting the report back, so that your next report doesn't contain the same errors.

3. Turn in one copy of this report to the Chief of Reports five working days after flying the data mission or two days after your graded Air Data Systems Calibration Report is returned, whichever occurs last.

REQUIREMENTS:

1. This report should contain complete results for a single altitude.

2. The required plots include specific excess power, load factor, turn radius, and turn rate as a function of Mach number (V_e for propeller aircraft) at test plan directed power settings.

3. Include a hand reduced point on each plot and include the hand calculations in an appendix.

4. Include your AFSC Form 5314 in an appendix.

5. If the data are available, each team member should present the results of testing at different altitudes.

6. Include all required plots as identified in your test plan.

LIFT/DRAG CHARACTERISTICS REPORT

REFERENCES:

1. Performance Phase Planning Guide.
2. The Author's Guide to Writing AFFTC Technical Reports.
3. Performance Phase Textbook, Chapter 14, "Aerodynamic Modeling"
4. Herrington, Russel M., Flight Test Engineering Handbook, AF Technical Report No 6273, AFFTC, Edwards AFB, CA, January 1966

PURPOSE:

To present the lift and drag characteristics of your aircraft.

TYPE OF REPORT:

Individual Interim Written (without Intro section)

SCENARIO:

You are on a test team conducting performance evaluations of a new aircraft. The test director wants a information on the aircraft's lift and drag characteristics.

OBJECTIVE:

As per your test plan.

ADMINISTRATIVE ITEMS:

1. This report may be handwritten.

2. This is a pass/fail report.

3. Turn in one copy of this report to the Chief of Reports five working days after flying the last data mission.

REQUIREMENTS:

1. The flight report should include enough detailed information, along with supporting references, so the specific test could be repeated in the identical configuration using the same instrumentation, and similar results obtained under duplicate environmental conditions. Above all, keep in mind the limited scope of the test and report accordingly. You don't get extra points for extra pages, so keep it short but complete.

2. This report should contain results on one test condition.

3. Include all required plot(s) as identified in your test plan.

4. Hand calculate one data point and include these calculations in an appendix. Plot the hand-reduced point with your other data.

5. Include your AFSC Form 5314 in an appendix.

CRUISE PERFORMANCE REPORT

REFERENCES:

1. Performance Phase Planning Guide.
2. The Author's Guide to Writing AFFTC Technical Reports.
3. Performance Phase Textbook, Chapter 11, "Cruise Performance Theory."
4. MIL-C-005011B, Charts.

PURPOSE:

To present the results of a cruise performance test.

TYPE OF REPORT:

Individual Interim Written

SCENARIO:

You are on a test team conducting performance evaluations of a new aircraft. The test director wants an interim report on the aircraft's cruise performance.

OBJECTIVE:

As per your test plan.

ADMINISTRATIVE ITEMS:

1. This report may be handwritten. It should require about 10 pages but should not exceed 20 pages.

2. This is a graded report.

3. Turn in one copy of this report to the Chief of Reports seven working days after flying the data mission or two days after your Maneuver Performance Report is returned, whichever occurs last.

REQUIREMENTS:

1. Include hand calculations for one data point and include the hand calculations in an appendix.

2. Include your AFSC Form 5314 in an appendix.

3. This report should contain results for a single altitude.

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PERFORMANCE FINAL CHECK RIDE REPORT

REFERENCES:

1. Performance Phase Planning Guide.
2. C-130 Flight Manual.
3. Performance Phase Textbook.

PURPOSE:

To present the results of the FTE/N Performance Final Flying Evaluation.

TYPE OF REPORT:

Individual Daily Oral (Debriefing) and Individual Daily Written

SCENARIO:

See the Performance Phase Planning Guide for this mission.

OBJECTIVE:

Determine the performance of the C-130.

ADMINISTRATIVE ITEMS:

1. This report consists of two parts:

a. AFSC 5314. This form may be handwritten. It is due at the oral debrief, two days after the flight. Include analysis and data as specified in the Performance Phase Planning Guide.

b. An oral debriefing to the staff FTE/N who flew on the mission. This debriefing will occur two working days after the flight and will not exceed 20 minutes. Uniform for the debrief is flight suit. The pilot member of the team may be present for this debriefing. Present information as specified in the Performance Phase Planning Guide.

2. This is a graded event for the FTE/N.

REQUIREMENTS:

1. Take all data from production instruments. Assume instrument corrections are zero.

2. Use hand held test day data for the reports.

3. Include the following results in support of the oral report.

a. Takeoff Data. V_i and S_g at takeoff.

b. A plot of Check Climb data. Time, distance, fuel, and rate of climb vs altitude. Also, compare your data with the flight manual.

c. A plot of Descent Data. Same as climb.

d. A plot of Level Acceleration Data. P_s vs V_i.

e. A plot of Sawtooth Climb Data. Rate of Climb vs V_i.

f. A plot of Turn Data. Load Factor, Radius of Turn and Rate of Turn vs V_i.

g. Cruise Data. W/δ compared to the Flight Manual.

LIMITED PERFORMANCE EVALUATION

REFERENCE:

1. Performance Phase Planning Guide.
2. The Author's Guide to Writing AFFTC Technical Reports.
3. Performance Phase Textbook.
4. Aircraft Flight Manual.
5. MIL-C-005011B.

PURPOSE:

To present the results of your limited performance evaluation. When complete, this report should be of publication quality as an AFFTC Technical Report.

TYPE OF REPORT:

Group Final Written

FORMAT:

Include Test and Evaluation sections for the following:

a. General
b. Air Data Systems Calibration
c. Propulsion System Performance Validation
d. Lift and Drag Characteristics
e. Takeoff Performance
f. Cruise Performance
g. Maneuver Performance

Sections b through g will include test objectives, test method, and test results subsections.

SCENARIO:

You are on a test team conducting a limited performance evaluation of a new aircraft. This report summarizes all performance testing accomplished. No further performance testing is planned. Write this report to the new aircraft's System Program Office (SPO).

OBJECTIVE:

As per your test plan.

ADMINISTRATIVE ITEMS:

1. Type this report. Typing errors may be corrected in ink; however, it is always advisable to minimize such errors.

2. Proofread your work and check for consistency between sections.

3. The due date is 10 working days after the last data flight for your group. Each group will turn in a separate report.

4. Submit four copies of your report to the Chief of Reports. The test team director for each group should retain the original. Use a TPS blue cover for the original. All test team members sign the inside cover.

5. The primary source of data should come from the sorties flown by your group. Due to the large number of test points required by your test plan, it will be necessary to use data collected by other groups for your type aircraft to supplement your data. Using the other group's data means obtaining a set of data points from a central pool, but not obtaining a plot with the curve already drawn through the data. It is important to realize that your group is to analyze the data in your report, and drawing curves through data points is considered a part of the analysis process. If there are any questions regarding the intent of this paragraph, ask the Chief of Reports prior to exhausting a large amount of effort in the wrong direction.

6. This is a graded report. It is the final academic evaluation in the Performance Phase, excluding the final flying evaluation. It includes the results of your data flights, data reduction and analysis, and your group's writing effort. The writing of this report is an organizational and administrative effort that should be valuable to each of you. It should be a valuable learning tool that will represent your combined understanding of performance theory and testing. The grade you receive on this report will indicate three things:

   a. How well you understand the material in the Performance Phase.
   b. How well you, as a group can write a report.
   c. How well you work together as a group.

The graders will be judging two broad categories--first, the technical merit and/or engineering judgment you display in the way you analyze and present the data, and second, your ability to follow a report format given to you by your boss. Of these two broad categories, the former is paramount. Formats may come and go, but good engineering will always stand out. Each grader understands the many hours each of you has put in to it. Grading is a highly subjective process. The apparent likes or

dislikes or "Catch 22" situation is an exact analogue to the AFFTC "Technical Review." Every technical report that is published by the AFFTC is "graded" prior to release using the Technical Review. Several reviewers cast their critical eye on the product of your labors. It doesn't get the general's signature until they are satisfied. They don't usually agree with each other the first time. They will alter and adjust your wording and analysis until it conforms to their collective idea of a "good report."

REQUIREMENTS:

1. Report on the objectives stated in your test plan.

2. Evaluate your designated aircraft (a typical production representative aircraft) for its performance suitability in the mission specified in your test plan.

3. State whether your aircraft met the system specifications listed in your test plan. It is not part of your charter to evaluate the validity of these specifications.

4. Use the current flight manual as a contractor's proposed handbook, and check it for accuracy (both narrative sections and performance estimates in the appendices).

5. The required plots for this report are dictated by the test plan.

ADDITIONAL INFORMATION:

The following information is provided to help clear up common problems.

System Specification: A system specification is a negotiated item between the contractor and the procuring agency. Since you may not know the details which generated a particular specification, it is your responsibility as the tester to determine if the specification is or is not met. In the report you should simply state whether the specification was met, and quantify, with a percentage, the amount of deviation from the desired value. For example, "The maximum range of the T-38A was 700 nautical miles, which was 20 percent less than the system specification of 875 nautical miles." It is not appropriate to make a recommendation to fix this deficiency. If however, the statement of need (SON) requires 875 NM or your knowledge of the finding with respect to the mission allows you to comment on the significance of your finding with respect to mission suitability, then do so.

Mission Suitability: Further, you are provided with "Desired Technical Characteristics." These are not specifications but reflect the using command's desires. Use them to help evaluate mission suitability. Feel free to use your experience with the mission to evaluate the aircraft's mission suitability (or unsuitability). These

technical characteristics provide a complete picture of the mission requirements and include characteristics you are not expected to test. In your report, discuss only those characteristics which you tested.

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FLYING QUALITIES REPORTS

MODEL IDENTIFICATION REPORT

REFERENCES:

1. Flying Qualities Phase Planning Guide.
2. Flying Qualities Textbook, Chapters 13 & 15.
3. The Author's Guide to Writing AFFTC Technical Reports.
4. AFFTC-TLR-91-SO.2

PURPOSE:

To present the results of a parameter estimation and frequency response flight test.

TYPE OF REPORT:

Individual Daily Written (one per test team)

SCENARIO:

You are testing your data group aircraft for model identification and gain and phase margin identification purposes. Your group is flying one sortie out of many that will be required. The lead engineer has asked you to report on your findings in preparation for an interim report that will eventually be written.

OBJECTIVE:

Determine the aerodynamic model of your data aircraft at the flight conditions tested. Additionally, determine that model's response to typical frequency inputs.

ADMINISTRATIVE ITEMS:

1. This report may be handwritten.

2. This is a pass/fail report.

3. As with any initial flight report, the AFSC Form 5314 should be prepared as soon as possible following the flight test. However, the form should be turned in along with the analysis and data package five working days after the data flight to the flight controls instructor.

4. One pilot and one engineer will be scheduled as a test team for each sortie. Due to the varying Pilot/FTE/FTN ratios, some FTE/Ns may be required to participate in two missions and resulting reports.

REQUIREMENTS:

1. Determine the aerodynamic model of your data aircraft at the test conditions. This should be done at 1g and 2g for the longitudinal axis.

2. Show the frequency response of the aircraft for the same flight conditions. Are the gain and phase margin adequate?

3. Comment on the mission suitability of the aircraft for the maneuvers tested and discuss whether problems identified on your sortie warrant a change in build up approach, gain scheduling, or a change in the flight control laws.

4. Required plots:

   a. Bode plots (Amplitude and phase as a function of frequency), annotated with gain and phase margin.

   b. A match of the time history predicted by the model you identified with the actual time history of the aircraft for each axis. Note: Do not use the same data set to verify the model that you used to estimate it.

5. Tabular data:

   a. The aircraft model and transfer function.

   b. Stability derivatives versus angle of attack for all axis.

LONGITUDINAL STATIC STABILITY AND MANEUVERING FLIGHT REPORT

REFERENCES:

1. Flying Qualities Phase Planning Guide.
2. The Author's Guide to Writing AFFTC Technical Reports.
3. MIL-STD-1797A, Flying Qualities of Piloted Aircraft.

PURPOSE:

To present the results of longitudinal static stability and maneuvering flight tests.

TYPE OF REPORT:

Individual Interim Written

SCENARIO:

Your System Program Office (SPO) is looking at several existing aircraft designs. The proposed mission for the aircraft is the same as listed in your Flying Qualities Test Plan. The SPO wants feedback from you on the aircraft flying qualities and any problems with the aircraft design. The SPO has authorized two longitudinal flying qualities sorties. They are interested in both qualitative and quantitative data from your flights.

OBJECTIVE:

As per your test plan.

ADMINISTRATIVE ITEMS:

1. The report may be handwritten.

2. This is a graded report. You may debrief the report with the grader prior to getting the report back so that your next report doesn't contain the same errors.

3. Turn in one copy of the report to the designated grader five working days after flying your first longitudinal stability and maneuvering flight sorties.

LONGITUDINAL STATIC STABILITY REQUIREMENTS:

As per your test plan.

MANEUVERING FLIGHT REQUIREMENTS:

As per your test plan.

GENERAL REQUIREMENTS:

1. Reduce all useable data not included in your plots into tabular form and include in an appendix.

2. Sample calculations are required for the flight path stability data, and should be included in an appendix.

3. Include your AFSC Form 5314 in an appendix.

LATERAL DIRECTIONAL STABILITY REPORT

REFERENCES:

1. Flying Qualities Phase Planning Guide.
2. Tongue and Quill, pages 77-112.
3. MIL-STD-1797A, Flying Qualities of Piloted Aircraft.

PURPOSE:

To brief the results of a lateral directional test of a new aircraft.

TYPE OF REPORT:

Formal Individual'Oral (PR^2)

SCENARIO:

The 6510th Test Wing Commander wants to know the lateral directional characteristics of your test aircraft. You will brief him and his technical analyst on the results of your last flight.

OBJECTIVE:

As per your test plan.

ADMINISTRATIVE ITEMS:

1. The uniform for this briefing will be the combination one (class A or equivalent for non-USAF).

2. The presentation will be planned for 15 ±2 minutes in duration, followed by a five minute question and answer period, and then a five minute debriefing by the instructors. Adhere to the timing constraints!

3. This is a pass/fail report. Instructors will evaluate your speaking ability, briefing organization and your technical knowledge. Other considerations will include the briefings content and your knowledge of applicable MIL-STD-1797A paragraphs. All presentations failing to meet the minimum standards will be revised and reaccomplished within five working days.

4. Visual aids are required for the briefing, but no audio-visual services from on-base organizations are authorized. The slides may be hand written. The time spent preparing for this briefing should be devoted to the organization and delivery, not professional quality visual aids.

5. The individual orals will be scheduled on the weekly schedule to include time, place, student, and instructors. Be prepared. You may be required to present your oral as early as five working days following your first lateral directional flying qualities data flight.

REQUIREMENTS:

1. Choose one data point from the overall Flying Qualities Test Plan which you flew.

2. Report on all applicable paragraphs in the Lateral Flying Qualities Test Section of your test plan.

3. Report on all paragraphs in the Static Directional Flying Qualities Test Section of your test plan.

4. Determine if the lateral directional flying qualities of your aircraft make it suitable for its intended mission.

5. Include qualitative as well as quantitative data.

6. Present graphical data of the test points during the briefing.

7. Do not include sample calculations.

8. We realize that the amount of information you are asked to present in 15 ±2 minutes is unrealistic. You must decide what is the most important information, and construct your briefing appropriately. You are responsible for all the MIL STD paragraphs, but you may not be able to discuss each one during your briefing. Have backup information available to address any of the paragraphs you do not brief. Remember, choose what your decide to brief carefully.

9. Use the PR^2 format with the presentation slide on the top half of the page and the narrative on the bottom half of the page. See The Author's Guide to Writing AFFTC Technical Reports for further guidance on the PR^2.

ENGINE OUT REPORT

REFERENCES:

1. Flying Qualities Phase Planning Guide.
2. Flying Qualities Textbook, Engine Out Theory, Chapter 11.
3. MIL-STD-1797A
4. MIL-C-005011B
5. The Author's Guide to Writing AFFTC Technical Reports.

PURPOSE:

To present the results of the engine out flight evaluation.

TYPE OF REPORT:

Group Technical Letter Report .

SCENARIO:

Lockheed has proposed a "C-141SP" to the Special Operations SPO. Though about 20 feet shorter than the "B" model, the "SP" would take advantage of the weight reduction for extended range and better operations into short fields. The SPO is concerned about an increase in V_{mca} as well as other engine out issues. Your group has one flight to evaluate the differences in engine out performance and control between the "B" model and the "SP". Your group will submit a technical letter report with your findings to the Special Operations SPO, "ASD/VXT".

Two pilots and one or two engineers will normally be scheduled together as a test team. Each test team will report on the results of their flight. Because of various pilot, navigator, and FTE ratios some navigators and FTEs may participate on more than one engine out sortie. They are only required to participate in one report.

OBJECTIVES:

Determine the engine out performance and flying qualities of the "C-141SP".

1. Qualitatively evaluate the engine out stall qualities of the C-141SP.

2. Evaluate V_{mca} with one engine failed for the C-141SP. Predict the C-141SP V_{mca} and compare to the C-141B flight manual value at the following condition:
   a. Standard day.
   b. Sea level.
   c. 150,000 pounds gross weight.
   d. 5° bank.

e. One engine inoperative (windmilling).

f. Three engines at TRT (air conditioning off).

(Use the data collected from all static V_{mca} points flown, i.e. varying airspeed and constant airspeed method.)

3. Evaluate the dynamic failure of one engine in the takeoff configuration and its impact on static V_{mca}. Evaluate the dynamic failure of two engines at cruise.

4. Evaluate the initial climb performance with one engine failed. Determine whether it meets the MIL-C-005011B minimum climb gradient and compare it to the corresponding C-141B flight manual value. Determine if the C-141B flight manual procedures and airspeeds are adequate for use in the SP.

5. Evaluate the trimmability of the C-141SP during an engine failure.

6. Qualitatively evaluate the flight manual procedures for an engine out approach, landing and go around.

7. Determine compliance with the following paragraphs of MIL-STD-1797A.

4.1.114	4.6.5.1
4.1.13.5	4.6.6.2
4.5.8.4	4.6.7.8
4.5.9.5.5	4.8.4.2.4

ADMINISTRATIVE ITEMS:

1. This letter may be handwritten. The goal is four pages, maximize analysis for the SPO.

2. This report is graded.

3. The AFSC 5314 should be prepared as soon as possible after the flight. However, it should be submitted along with the letter report five working days after the flight to the IP with whom you flew the engine out sortie.

REQUIREMENTS:

1. Data Plots:

a. For bank angle equal to zero, plot F_r, δ_r, F_a, δ_a versus V_c. Identify MIL-STD-1797A limits.

b. C_N versus $C_L \sin \phi$ for all stabilized V_{mca} points.

2. Tabular Data:

a. EPR, ϕ, V_c, H_c, M and W for all points used in the C_n versus $C_l \sin \phi$ plot.

b. Maximum transients of Vc, ϕ, Ψ, ω and β during the one engine dynamic failure.

c. Maximum control forces and deflections used during recovery from the one engine dynamic failure.

d. Rate of climb, climb gradient (%), TAS, and β for each of the engine out climb configurations tested.

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DYNAMICS AND OPERATIONAL HANDLING REPORT

REFERENCES:

1. Flying Qualities Phase Planning Guide.
2. The Author's Guide to Writing AFFTC Technical Reports.
3. MIL-STD-1797A, Flying Qualities of Piloted Aircraft.

PURPOSE:

To present the results of a dynamics test and your assessment of the aircraft's mission suitability.

TYPE OF REPORT:

Individual Interim Written

SCENARIO:

The SPO is interested in your aircraft's ability to perform its intended mission. Be sure to relate all your findings to the mission.

OBJECTIVE:

As per your test plan.

ADMINISTRATIVE ITEMS:

1. This report may be handwritten.

2. This is a graded report.

3. Turn in one copy of the report to the Chief of Reports five working days after flying the first operational handling data sortie (this assumes the dynamics data sortie has already been flown).

REQUIREMENTS:

1. Choose one data point from the overall Flying Qualities Test Plan for your group assigned aircraft.

2. Evaluate the aircraft using the MIL-STD-1797A paragraphs per your test plan.

3. Report on one data point for the five classical dynamic modes of motion (Phugoid, Short-period, Dutch roll, Roll, and Spiral) to determine specific MIL-STD-1797A compliance.

4. Compare the phugoid natural frequency from flight test data with the approximation formula from class. This should be discussed in the test and evaluation section of the report.

5. Include representative data plots from the five dynamic modes of motion and those used to evaluate compliance with the paragraphs of MIL-STD-1797A listed in your test plan in an appendix. These strip chart recordings or equivalent plots should include the appropriate scales and labels to identify the variable recorded.

6. Include sample hand calculations for the five data points chosen. As a minimum, show one complete calculation for each MIL STD paragraph that requires a calculation. To see small input oscillations, you may have to expand your strip chart data or use digital data. You may also have to use SAS or CAS off flight data to obtain usable plots for small input calculations.

7. Report on all operational handling tasks and HQDT flown on your mission. Accurately describe each task and its results. Include pilot comments.

8. Include your AFSC Form 5314 in an appendix.

ADDITIONAL INFORMATION:

The following information should clear up some common problem areas or questions.

MIL Specification requirements versus mission suitability:

1. Remember, even though a particular finding does not meet the requirements of the MIL SPEC, it may still be satisfactory for the mission. For example, the phugoid may fail the MIL SPEC, but is judged acceptable since it does not impair the pilot's ability to perform the mission. If you say this, a reason is important. To continue our example,

> "the phugoid's low frequency made aircraft responses to this mode extremely slow. The pilot's normal control inputs easily damp the phugoid and add no additional workload to the pilot."

2. The reverse possibility, where the aircraft passes the MIL SPEC but is unsuitable for the mission, may also occur. This statement also requires strong explanations.

FTE/N FLYING QUALITIES CHECKRIDE REPORT

REFERENCES:

1. Flying Qualities Phase Planning Guide.
2. MIL-STD-1797A, Flying Qualities of Piloted Aircraft.

PURPOSE:

To present the results of a single flight, flying qualities evaluation of a "new" aircraft.

TYPE OF REPORT:

Individual Daily Written and Debrief.

SCENARIO:

The scenario for this event will be provided by the Chief of Flying Qualities.

OBJECTIVE:

Determine the flying qualities of your "new" aircraft, and compare them to the military specification.

ADMINISTRATIVE ITEMS:

1. Limit the report to four handwritten (or typewritten) pages plus necessary "rough" data plots.

2. Brief the report to your IP in a "one on one" scenario. The briefing time will be 20 minutes followed by a 10 minute question and answer period. No viewgraphs are permitted. Brief from your individual daily written. Present the flight test results to the staff IP prior to 1800 hrs two days following the flight.

3. The uniform for the briefing is a flight suit.

4. This is a graded event with the following percentage breakdown:
   a. Mission Analysis and Priority of Data Points 25%
   b. Data Interpretation 25%
   c. MIL-STD-1797A Compliance and Application of Cooper-Harper pilot ratings 25%
   d. Conclusions and Recommendations 15%
   e. Presentation Mechanics (Time, etc.) 10%

REQUIREMENTS:

1. Acquire all quantitative data using hand held techniques. This implies using a force gauge, tape measure, or stop watch where applicable.

2. Write the report using hand held test day data.

3. Include aircraft configuration, test limitations, FTTs, open and closed-loop results, qualitative remarks, MIL-STD comparisons, and mission suitability.

FLYING QUALITIES ORAL REPORT

REFERENCES:

1. Flying Qualities Phase Planning Guide.
2. Tongue and Quill, Pages 77-112.
3. MIL-STD-1797A, Flying Qualities of Piloted Aircraft.

PURPOSE:

To present the results of a limited flying qualities evaluation of a new aircraft.

TYPE OF REPORT:

Group Formal Oral (PR^2)

SCENARIO:

The briefing is being presented to the System Program Office (SPO) Director and his technical analysts. You may assume the SPO Director is both a former Test Pilot School Graduate and Combined Test Force Director. Although the briefing simulates a real world situation, you must remember this is an academic environment. Be prepared to support your analysis with some degree of technical insight.

OBJECTIVE:

Determine the flying qualities of your aircraft, as well as whether the aircraft's flying qualities are suitable for its mission. (see test plan)

ADMINISTRATIVE ITEMS:

1. The uniform for this briefing is the service dress or equivalent.

2. This is a graded report. The grade will be awarded to the group; however, special recognition may be given to individuals who do an especially outstanding job. Likewise, an individual who obviously detracts significantly from the group effectiveness may receive special recognition.

3. The oral report will be given in the TPS auditorium. A detailed schedule with times for each data group and a list of graders will be available the week prior to your presentation. All groups will attend all presentations.

4. Each group member is expected to present a portion of the briefing.

5. Plan the presentation to take 50 minutes (±5). Following the briefing, the group will field questions for 15 minutes. A critique of the briefing will follow the question period.

6. Viewgraphs, slides, video, or any other visual aid which will enhance the presentation are appropriate. However, do not expend an inordinate amount of time on the preparation of visual aids. Keep the visual aids clear, concise, and supportive of the information being discussed. Computer drawn slides are not required. Slides may be handwritten, but they should be neat and consistent between speakers. It is helpful to number your slides for reference during the question and answer session.

7. It is recommended that you seek assistance from the staff if questions arise concerning content or format. Prior to the formal presentation, ask one or two staff members not participating as core graders to critique a practice session.

REQUIREMENTS:

1. State clearly the aircraft's intended mission and relate results of your flight test to the aircraft's ability to perform that mission. Use qualitative and quantitative data as support for your results.

2. Present representative data from each area of evaluation. This is especially important in areas where you find noncompliance with the MIL STD or failure to meet operational criteria. Remember that your professional opinions and qualitative assessments are important and should complement the more quantitative analysis required by the MIL STD or operational requirements.

3. Follow the PR^2 format with the presentation slide on the top half of the page and the narrative on the bottom half.

ADDITIONAL INFORMATION:

1. Typical Oral Format

The following is a typical format, it is only provided as a reference and does not constitute the only or best way to present your topic. Feel free to use it or change it to fit your needs. Consider asking a Navy TPS graduate how they do it there. The six step paragraph they are taught is really good for emphasizing mission suitability.

I. INTRODUCTION
   A. BACKGROUND INFORMATION
   B. TEST ITEM DESCRIPTION
   C. INSTRUMENTATION DESCRIPTION

II. OBJECTIVES
   A. PURPOSE OF EVALUATION (keep mission in mind)
   B. WHAT CRITERIA (MIL-STD-1797A, qualitative)

III. TEST AND EVALUATION
   A. TEST CONFIGURATION'S AND DATA POINTS
   B. LIMITATIONS
   C. FLIGHT TEST TECHNIQUES
   D. DATA REDUCTION AND EVALUATION

IV. CONCLUSIONS AND RECOMMENDATIONS
   A. COMPLIANCE WITH MIL-STD-1797A
   B. QUALITATIVE ANALYSIS (related to mission)
   C. OVERALL CONCLUSIONS
   D. RECOMMENDATIONS
      (prioritize in view of limited budget)

2. Mission Suitability and Open vs Closed Loop Results

Remember to work toward achieving a balanced briefing that ties together open-loop and closed-loop test results to lead to a mission suitability conclusion. Don't forget that pilot comments about how an airplane flies are very important and can greatly enhance your presentation. Also, it is common to put the bottom-line early in the briefing, as well as at the end. This is an accepted practice since it helps your audience follow your briefing through to the conclusions and not have to guess where your headed.

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F-16 DEEP STALL REPORT

REFERENCES:

1. Flying Qualities Phase Planning Guide.
2. MIL-STD-1797A, Flying Qualities of Piloted Aircraft.
3. MIL-STD-83691A, Stall/Post-Stall/Spin Flight Test.

PURPOSE:

To present the results of a limited deep stall flight evaluation of the F-16.

TYPE OF REPORT:

Individual Daily Written

SCENARIO:

You have been authorized one flight in the F-16 to verify deep stall characteristics in Section 6 of the Flight Manual. A decision to perform further flight test on the F-16 is dependent on your report.

ADMINISTRATIVE ITEMS:

1. This report may be handwritten.

2. This is a pass/fail report.

3. This report is due the next working day after your evaluation flight and should be turned in to the IP with whom you flew the mission.

REQUIREMENTS:

The following items will be addressed in your report.

a. Adequacy of stall warning.
b. Handling qualities above 20.5 units AOA.
c. Adequacy of deep stall warning and characteristics.
d. Recovery characteristics.
e. Altitude loss from deep stall to wings level recovery.
f. Maximum rates and accelerations experienced (if data are available).

SYSTEMS REPORTS

REPORT TITLE	TYPE	PAGE #
Human Factors Cockpit Eval	Individual Daily Written	3.51
Pilot's Systems Eval Checkride	Technical Letter Report (Pilots)	3.53
ASTTA Exercise	As Required by Handout	3.55
Captive Compatibility/ Asymmetric Stores	Individual Daily Written (Pilots)	3.57
FTN Systems Eval Checkride	Individual Technical Letter Report (FTNs)	3.59

HUMAN FACTORS COCKPIT EVALUATION REPORT

REFERENCES:

1. Systems Phase Planning Guide.
2. Applicable aircraft flight manuals

PURPOSE:

To present the results of a single human factors cockpit evaluation.

TYPE OF REPORT:

~~Individual Daily Written~~ Group Technical Letter Report

SCENARIO:

Your boss has asked you to qualitatively evaluate your aircraft's ability to do its mission based on human factors in the cockpit.

OBJECTIVE:

From the standpoint of human factors, determine the suitability of your assigned aircraft to adequately perform its intended mission.

ADMINISTRATIVE ITEMS:

1. Each group will consist of 4 to 5 students
1. This report may be handwritten and must be double-spaced. No minimum length is specified. The report page count not including attachments will be no more than 3 times the number of students in each group. (ie. 12 pages for a 4 student group)
2. This is a pass/fail report.
3. This report is due ~~one week~~ 10 days after your cockpit evaluation.

REQUIREMENTS:

~~You must report on eight human factors deficiencies as well as field of view for your respective aircraft.~~ See the System's PDP for the scope of the report.

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PILOT'S SYSTEMS EVAL CHECK RIDE REPORT

REFERENCES:

1. Systems Phase Planning Guide.
2. Authors Guide to Writing AFFTC Technical Reports.
3. F-16 Flight Manual.

PURPOSE:

To present the results of a single flight evaluation of the F-16 systems.

TYPE OF REPORT:

Individual Daily Written

SCENARIO:

You have been authorized one flight in an F-16 to observe and evaluate the systems capability of the aircraft to perform Battlefield Air Interdiction (BAI). A decision to buy or reject this aircraft may depend on your report.

OBJECTIVE:

Determine if the F-16 systems, individually and collectively, are suitable for the BAI mission.

ADMINISTRATIVE ITEMS:

1. This report may be handwritten. No minimum length is specified. A desired maximum of 15 pages and an absolute maximum of 20 pages is specified.

2. This is a graded report. The report counts as 40 percent of your overall F-16 systems evaluation checkride.

3. An AFSC Form 5314 should be written within 24 hours of the flight, but may be attached to the TLR. The letter report is due three days after your evaluation flight. Turn both the 5314 and the letter report in to the IP with whom you flew the mission.

REQUIREMENTS:

Include the following subjects:

a. Evaluation of the HUD, INS, Fire Control, Navigation Computer, Radar Altimeter, Radar, Stores Management, Set Cursor Controller, Cockpit Layout, and Autopilot.

b. Weapons delivery capability (WTOS, CCIP, CCRP, and loft for BAI).

c. Navigation capability or low level and medium altitude.

d. Any other function or layout of the F-16 that affects its ability to perform the BAI mission.

ADDITIONAL INFORMATION:

1. This mission is very intense, and you will collect a large amount of technical data. Minimize reporting on events or system characteristics which do not directly relate to the mission objectives listed in Reference 1 under F-16 Systems Evaluation. The name of the game is "clear, concise, and to the point."

2. Do not evaluate the performance of flying qualities of the F-16 in this report. Evaluate the F-16's systems both individually and collectively. Take the aircraft's performance as a given which cannot be modified.

3. It is appropriate to address the impact of the aircraft's performance or flying qualities on the systems.

ASTTA EXERCISE

See Class Handout.

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CAPTIVE COMPATIBILITY/ASYMMETRIC STORES REPORT

REFERENCES:

1. Mil-HDBK-244.
2. Mil-STD-1763.
3. Systems Phase Planning Guide.
4. F-15 Flight Manual.

PURPOSE:

To present the results of your captive compatibility flights.

TYPE OF REPORT:

Individual Daily Written

SCENARIO:

You are testing the 610 gallon fuel tank on a wing station of an F-15 in an asymmetric carriage profile. Your test limits and profile are specified in Reference 3.

OBJECTIVE:

Determine if the asymmetric 610 gallon tank is compatible with the F-15 on the wing station (captive only).

ADMINISTRATIVE ITEMS:

1. This is a pass/fail report.

2. The report may be handwritten.

3. The report is due two working days after completing the flight and should be turned in to the instructor with whom you flew the mission.

REQUIREMENTS:

Write the report using hand held data and qualitative comments.

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FTN SYSTEMS EVALUATION CHECK RIDE REPORT

REFERENCES:

1. Systems Phase Planning Guide.
2. Applicable Aircraft Flight Manual.

PURPOSE:

To present the results of a single flight evaluation of aircraft systems for a designated mission.

TYPE OF REPORT:

Individual Technical Letter Report

SCENARIO:

You have been authorized one flight in the aircraft to determine the suitability of its systems for a specific role. The type aircraft and its role will be designated by the Chief of Systems Branch. Assume evaluation aircraft will be flown with a crew of two (or more). A decision to buy or reject this aircraft may depend on your report.

OBJECTIVE:

Determine if the aircraft systems, individually and collectively, are suitable for the designated mission.

ADMINISTRATIVE ITEMS:

1. This report may be handwritten and must be double-spaced. No minimum length is specified. A desired maximum of 15 pages and an absolute maximum of 20 pages is specified.

2. This is a graded report. The report counts for 40% of your overall systems evaluation checkride.

3. An AFSC Form 5314 should be written within 24 hours of the flight, but may be attached to the TLR. The letter report is due three working days after your flight. Turn in both reports to the IP with whom you flew the mission.

REQUIREMENTS:

Include evaluation of all systems which would normally be operated from the evaluated cockpit.

ADDITIONAL INFORMATION:

1. Minimize reporting on events or systems characteristics which do not directly relate to the mission.

2. Avoid reporting on performance and flying qualities of the aircraft. Take these qualities as givens which cannot be modified.

3. It is appropriate to address the impact of the aircraft's performance or flying qualities on the systems. For example, a rough ride which precludes activation of small switches should be mentioned.

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TEST MANAGEMENT REPORTS

REPORT/DOCUMENT TITLE	REPORT/DOCUMENT TYPE	PAGE #
Qual Eval Test Plan	Group Formal Written	3.63
Qual Eval Report	Group Informal Oral	3.67
A-37/F-16 Qualitative Evaluation Demonstration	Individual Daily Written	3.69
Single Look Qualitative Evaluations	Individual Daily Written	3.71
TEST MANAGEMENT PROJECT		
Test Concept	Group Test Concept Letter	3.79
Test Plan	Group Test Plan	3.87
Test Management Project Folder	---	3.97
Test Plan Working Group	Group Informal Oral	3.99
TRB/SRB	Group Informal Oral	3.101
Safety Review Approval Pkg	---	3.105
Data Management Folder	---	3.109
Program Assessment Review	Group Informal Oral	3.111
Pre-Writers Meeting	Group Informal Oral	3.119
Test Management Technical Report	Group Final Written/Group Formal Oral	3.121
Technical Coordination Meeting	Group Informal Oral	3.125

QUALITATIVE EVALUATION TEST PLAN

REFERENCES:

1. Qualitative Evaluation Groups Assignment Letter.
2. AFFTCR 80-1, Test Plans
3. Applicable Flight Manuals
4. Test Management Text, Chapter 2 "Test Planning"

PURPOSE:

To plan and organize a comprehensive qualitative evaluation of your specified aircraft for a proposed mission.

TYPE OF DOCUMENTATION:

Group Formal Written Abbreviated Test Plan. AFFTCR 80-1 describes the content of a Test plan as follows:

> "Test plans contain sufficient information to directly develop flight test cards and for management to discern the overall technical approach being taken. Therefore, test plans are the key documents that describe the specific tests to be accomplished and how they will be accomplished."

The abbreviated test plan format is presented below.

1. General Introduction (one paragraph, maximum)
   - Scenario
   - # Sorties required
   - Location
   - Timeframe
2. Objectives (This is a very IMPORTANT part of your test plan)
   - Overall
   - Specific
3. Test Conditions
   - Procedures/Methods/Techniques
   - Test Point Matrix (Can be in an Appendix)
   - Test Point Definition (Should accompany matrix)

A. Appendix - Safety
   - Test Limits

SCENARIO:

You will be divided into groups of two or three and tasked to conduct a formal evaluation of a particular aircraft for a specific mission. Details will be provided by your staff monitor.

OBJECTIVE:

Determine if your aircraft can perform the assigned mission.

ADMINISTRATIVE ITEMS:

1. You are required to develop a test plan, and get it approved, so you can evaluate your designated aircraft.

2. Previous test plans are available in the TPS Technical Library for your reference.

3. This is a graded document and it must be typed.

4. The draft test plan is due two weeks after your Qual Test Planning course and must be finalized at least five working days prior to the first data flight. It must go though the approval cycle and receive the signatures of the Staff Monitor, Qualitative Evaluation Program Manager, Test Management Branch Chief, and Directors of Student Training and Operations. A minimum of four copies of the final test plan should be made; two for the Qual files, one for your classroom, and one for the ops desk. This should all be accomplished prior to the first flight against the test plan.

5. Individuals who fly in your qualitative group aircraft, but are not members of your group, must provide you with a copy of their Daily/Initial Flight Test Report (AFSC Form 5314) within two working days after their flight. Remember to write your test plan such that individuals outside of your group can collect data for your evaluation.

6. If you are assigned to a qualitative group that requires flying off station, the test plan must be completed well in advance of the actual trip. Additional items or information may be required. For details, check with your staff monitor.

7. The entire Qualitative Evaluation Program has been technically and safety reviewed in conjunction with curriculum Phase Planning Guides and no further AFFTC or 412TW review is necessary.

8. If an unusual evaluation arises, the Commandant will be briefed and he will direct proper approval. Your staff monitor will let you know if this is necessary.

REQUIREMENTS:

1. Your test plan should allow you to answer the questions posed in your tasking letter. This will usually include determining mission suitability from the standpoint of performance, flying qualities, and systems.

2. Your test plan must be written in accordance with the restrictions listed in the limitations portion (Section II) of this document.

3. Amendments:

a. Amendments less restrictive or beyond the scope of your original test plan must be approved by the Directors of Student Training and Operations.

b. Amendments more restrictive but within the scope of your original test plan must be documented on a memorandum for record (MFR) and approved by your staff monitor and the Chief, Qualitative Evaluation Program.

4. All flight cards should come directly from your test plan and will be approved by the aircraft IP and a TPS IP (preferably the staff monitor for the aircraft) prior to being flown.

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QUALITATIVE EVALUATION REPORT

REFERENCES:

1. Qualitative Evaluation Groups Assignment Letter.
2. Applicable Flight Manuals

PURPOSE:

To report on the results of a formal qualitative evaluation on your assigned aircraft.

TYPE OF REPORT:

Group Informal Oral. There is no specific format for this report as long as you answer the mail.

SCENARIO:

Will be as directed by your staff monitor.

OBJECTIVE:

Determine if your aircraft can perform the assigned mission.

ADMINISTRATIVE ITEMS:

1. You will present your results orally to your class and the entire staff. All groups will attend all presentations.

2. This is a pass/fail report. Visual aids are required; however, they may be handwritten.

3. The oral will be scheduled no earlier than five working days after your last evaluation sortie. Due to scheduling requirements, the oral may be presented several weeks after your last flight, but don't count on that happening. The oral will be scheduled during one of your academic periods.

4. Your briefing in response to the given scenario should be approximately 15 minutes, but no longer than 20. If you go over 20 minutes, you will be asked to stop. Following your briefing, 10 minutes will be devoted to scenario type questions, after which you will have the opportunity to relate unique experiences to your class and the TPS staff for an additional 10 minutes. Finally, a 10 minute debrief will be conducted.

REQUIREMENTS:

1. Your presentation should answer the questions posed in your tasking letter as well as inform your audience about things they couldn't learn through reading the flight manual. For example, don't get up in front of your peers and tell them every label on every switch. Minimize presenting information that can be gathered by reading the flight manual. Get to the heart of the matter early. Stress relation to your tasked mission and what follow-up is necessary. Tell them things that you liked and disliked, and give examples of how these likes and dislikes might impact the day-to-day operational use. Go heavy into human factors and mechanization. Stress mission suitability from the performance, flying qualities, and systems aspects.

2. Formal qualitative evaluations are a reality in the test world with both tasking and reporting usually being of short notice. Answer the mail early: Do we use this aircraft for the tasked mission or seek another, what compromises are there, what problems are there, and what is their impact?

A-37/F-16 QUALITATIVE EVALUATION DEMONSTRATION REPORT

REFERENCES:

1. Section IV of this guide.
2. A-37 Flight Manual.
3. F-16 Flight Manual.
4. Applicable TPS textbooks.

PURPOSE:

To communicate your findings of a "quick look" evaluation flight of the A-37 or F-16.

TYPE OF REPORT:

Individual Daily Written

SCENARIO:

There may be a time in your career as a test pilot or even as a staff officer that you'll be given the opportunity to get a "quick look" at a system. This task may be levied upon you by your boss, the Program Office, or many other agencies; or your persistence may finally get you a flight in the Harrier, X-29, or Tilt Rotor aircraft. Under the "no free lunches" theory, you will be expected to convey your impressions of the system's potential. In this case, it is the A-37 or the F-16.

OBJECTIVE:

Determine if the A-37B or the F-16B/D suitable to perform its designated mission as specified in Reference 1 under A-37B/F-16 qualitative evaluation.

ADMINISTRATIVE ITEMS:

1. Submit your report to the instructor with whom you flew the mission.

2. The report may be handwritten and is due five working days after flying the mission.

3. This is a pass/fail report.

REQUIREMENTS:

Write your report with the designated mission for the aircraft in mind. You should analyze your findings and make recommendations if necessary. Commonly, students collect and analyze large quantities of data, but provide little to no conclusions or

mission relation regarding the data. Avoid this pitfall, as well as one in which you discuss only the mission with no data to substantiate your claims.

SINGLE LOOK QUALITATIVE EVALUATION REPORTS

REFERENCES:

1. Applicable flight manuals.
2. Applicable TPS textbooks.
3. Weapons manuals.

PURPOSE:

The purpose of the Qualitative Evaluation Program is to build a strong and broad foundation of experience by exposing you to the aircraft of the world's military and civilian sectors. Single look qual aircraft will fall into one or both of two general categories. Most will be current or recently current operational aircraft, but some will be purely experience broadening aircraft (i.e., blimp, helos etc). Your primary purpose for each single look qual eval is to plan, organize and fly each mission so you can gain as much knowledge and experience as possible from one sortie. In addition to learning specifics about a given aircraft you should also learn about the mission, tactics and employment philosophy. Whenever possible you should focus on mission suitability and make recommendations to improve mission capability. Your secondary purpose is to have fun and enjoy your experience.

TYPE OF REPORT:

Individual Daily Written

SCENARIO:

Evaluate each assigned operational qual aircraft in its ability to perform a particular mission of your choosing. If you are chosen to fly something in which you have no experience, we suggest you evaluate its operational mission. You are not required to accomplish a mission evaluation of an experience broadener aircraft. Simply report on what you learned from the experience.

OBJECTIVE:

Determine if your operational qual aircraft can perform the mission which you have chosen for evaluation. Make recommendations from your qualitative or quantitative observations on what could be improved to make the aircraft suitable (if found unsuitable) or increase its mission capability. Learn as much as possible from experience broadener aircraft quals.

ADMINISTRATIVE ITEMS:

1. Each report should be written as soon after your flight as possible, so no pertinent information is forgotten. Also, it should be written prior to your next qual flight or within two days, whichever is sooner.

2. If you fly another qual sortie prior to completing your report from your previous sortie, at least one of the outstanding qual reports must be completed prior to your being scheduled for any additional qual flights (i.e. 2 outstanding qual reports means no quals!).

3. Turn in each report to the Qual Eval Program Office, (located in the Test Management Branch), as soon as it's complete so you can avoid any scheduling problems.

4. This is a pass/fail report and may be legibly handwritten.

5. If appropriate, a copy of your qual report must be given to the student operational qual group.

6. Keep a copy of your report for yourself because it will serve as a valuable reference later in your testing career when you wish to recall particular aircraft characteristics.

7. Where more than one student flew on a given sortie, a single "group" daily report may be submitted.

REQUIREMENTS:

1. Provide a brief description of the aircraft (not a Dash One description). Note any unusual or outstanding characteristics. For example, if you notice it has an unusually large rudder, it might indicate a possible directional stability problem. You should be able to tell something about the way you expect an aircraft to fly just by its outward appearance.

2. Make note of what mission you evaluated the aircraft against or state that the flight was an experience broadener qual.

3. Make qualitative as well as quantitative evaluations and comments. Both are important, because you are the expert and your opinion counts!

4. Make conclusions regarding all of your evaluations (qualitative and quantitative), as they relate to the aircraft's intended mission. Back these conclusions up with

pertinent data; however, don't just give damping ratios and overshoots without some relation to its mission.

5. Make recommendations on ways to improve the aircraft's mission capability.

6. Highlight your recommendations when they occur in the text. (i.e., RECOMMENDATION: Improve display lighting harmony between the TSD and ADI on the F-15E MPCDs while in the night display mode.)

7. Avoid using the expressions "Always" and "Never!!" Examples of some good words to use are easy, comfortable, desirable, acceptable, difficult, etc.

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TEST MANAGEMENT PROJECT

REFERENCES:

1. Test Management Textbook, Chapter 2, "Test Planning."
2. AFFTC Reg 27-4, Processing Test and Test Support Requests.
3. AFFTC Reg 80-1, Test Plans.
4. AFFTC Reg 127-3, Safety Planning for AFFTC Tests.
5. Test Management Project Handouts.
6. Test Plans on file in TPS Library.

PURPOSE:

To provide a challenging task to further develop the student's ingenuity, technical competence, and leadership skill.

TYPE OF REPORT/DOCUMENTATION:

1. Group Test Plan (Includes Test Concept, Test Plan, Project Folder and Approval Package).

2. Informal Group Oral (Technical and Safety Review Board, and Program Assessment Reviews)

3. Group Final Written and Group Formal Oral Reports

GENERAL INFO:

1. The test management projects are probably the most demanding, yet satisfying, experiences in the TPS curriculum. Every effort will be made to conform with "real life" requirements and there will be no "canned" missions, techniques, or test methods upon which to rely. The test objectives may deal with performance, handling qualities, systems, or any combination of these disciplines. Each data group will be expected to exercise all they have learned at the TPS with particular emphasis on ingenuity, technical research, aggressive sense of mission accomplishment, and leadership skill. Effective leadership makes or breaks good test planning, test execution, and the reporting of oral and written test results.

2. The Test Management Projects have been designed to require the maximum cooperation within data groups. The Project Manager will have to assign specific projects or areas of responsibility within the team. These individuals, in turn, will have to determine and closely track requirements such as:

a. Support; i.e. SPORT, PIRA, instrumentation, scheduling, maintenance, administrative, technical documents, etc.

b. Preparation of data cards.

c. Briefing and debriefing of data missions.

d. Oral and written report formats.

In short, the results, from a technical and educational standpoint, will be directly proportional to how much effort each data group is willing to make.

3. This project should be considered a graduate "thesis," necessarily academic in many aspects. It should prepare you for your first "postgraduate" test project.

4. Each student test pilot/FTE/N will be assigned to a specific group. A group leader, Project Manager, will be designated at the time the groups are identified and projects assigned.

5. Each data group will have a staff monitor assigned to assist the group with support requirements and technical or procedural advice. The staff monitor will role play, when appropriate, as a SPO.

6. A test concept, test plan, and an AFSC Form 5028 Safety Analysis (SRB paperwork) will be prepared by each test group in accordance with instructions provided during the Test Planning Course and this document. At least one Test Planning Working Group (TPWG) will be convened for each test project prior to the Technical/Safety Review Board (TRB/SRB). Careful and comprehensive planning will have to be accomplished early in the test planning cycle to determine instrumentation and support requirements, especially if they are not "TPS standard." These requirements will be identified in the test concept.

7. Each test project will be technically and safety reviewed at a combined TRB/SRB. Instructions for the TRB/SRB will be provided during the Test Planning and Test/Systems Safety courses as well as in this document.

8. A written and oral report covering the results of the project will be prepared. CAUTION: The reader/audience will want to know "how" as well as "why" the results were determined.

TEST CONDUCT:

1. All test points on the extreme corners of the envelope listed in the test plan will be first flown by a TPS instructor. The IP will ensure that adequate ground clearance

and safety margin exists to safely recover the aircraft within the flight envelope and not exceed aircraft or engine limitations. Student data flights will not include edge of the envelope points (as defined by the Test Safety Review Board) until the safety margin has been established.

2. Test mission data cards will be prepared, approved, and used for each flight in accordance with the approved test plan.

3. As a minimum, the staff monitor or an instructor pilot current in the particular aircraft will review and initial the data cards prior to each flight. The SM will ensure that only the approved test points are contained on the data cards by cross checking them against the test plan. More formalized procedures may be in effect and will be briefed.

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 6510TH TEST WING (AFSC)
EDWARDS AIR FORCE BASE, CALIFORNIA 93523-5000

REPLY TO
ATTN OF: 6512 TESTS/DOY (Capt Stone, 57926)

SUBJECT: Test Concept, YA-7F

TO: AFFTC/XRP

1. This letter provides the test concept for YA-7F which is the DT&E of an upgraded A-7D aircraft. The following have been assigned to the program:

a. JON: 360601
b. AFFTC Priority: 1S
c. Reimbursement Code: BB
d. PI Number: P-87-05-06, Revision 2
e. Program Analyst: Mrs Josie Gray, 6510 TW/XRP, 74340
f. Program Manager: Lt Col Mark Prill, 6512 TESTS/DOY, 57933
g. Program Logistician: MSgt John Anderson, 6510 TW/MAXPI

2. The purpose of this test is to prove the concept of an upgraded A-7D with a F100-PW-220 engine, lengthened fuselage, and aerodynamic improvements. The program consists of 120 test sorties involving two prototype A-7F aircraft. The first flight at Edwards will be in Dec 89 and the program will last approximately 10 months.

3. Testing will include performance, flying qualities, structures, and high angle of attack. The YA-7F envelope will be verified out to the existing limits of the A-7D envelope.

MARK E. PRILL, Lt Col, USAF
YA-7F CTF Director

3 Atch
1. AFSC Form 5341 (3)
2. Notes
3. AFSC 103

FIGURE 3.1a SAMPLE TEST CONCEPT LETTER

FIGURE 3.1b SAMPLE AFSC 5341

TEST CONCEPT/TEST RESOURCE REQUIREMENTS

TITLE: YA-7F Prototype Modification Program

JOB NO: 360601

PREPARED BY (Name, organization symbol, extension):

SUPPLEMENT (Alpha symbol, if applicable):

REVISION:

FY: 90

DATE:

PI BOX	AIRCRAFT REQUIREMENTS			MONTHS											
	TYPE AIRCRAFT		NUMBER	90 OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
	TEST A/C	YA-7F	FLIGHTS		6	6	14	15	15	16	16	16	10	6	3
			FLYING HOURS		9	9	21	22.5	22.5	24	24	24	15	9	4.5
	SUPPORT AIRCRAFT	A-7D (Note 10)	FLIGHTS		4	7	8	11	9	17	9	9	6	2	2
			FLYING HOURS		6	11.5	12	17.5	13.5	21.5	13.5	13.5	9	3	3
		F-4 (Note 11)	FLIGHTS		6	1	4	4	4	4	4	4	2	2	
			FLYING HOURS		9	1.5	6	6	6	6	6	6	3	3	
		A-37 (Note 12)	FLIGHTS							4					
			FLYING HOURS							4					
		T-38 (Note 12)	FLIGHTS							4					
			FLYING HOURS							4					
	OTHER REQUIREMENTS														
	Test Management (Note 1)			X	X	X	X	X	X	X	X	X	X	X	X
	Facilities (Note 2)			X	X	X	X	X	X	X	X	X	X	X	X
	Maintenance (Note 3)			X	X	X	X	X	X	X	X	X	X	X	X
	Range (Note 4)			X	X	X	X	X	X	X	X	X	X	X	X
	Data Processing (Note 5)			X	X	X	X	X	X	X	X	X	X	X	X
	Flight Dynamics (Note 6)			X	X	X	X	X	X	X	X	X	X	X	X

AFSC FORM 5341, NOV 86 REPLACES AFTC FORM 302, MAY 75, WHICH MAY BE USED

TEST CONCEPT/TEST RESOURCE REQUIREMENTS

TITLE: YA-7F Prototype Modification Program

PREPARED BY (Name, organization symbol, extension): Capt Robert Stone, 6512 TESTS/DOY
Phone: 277-3240

SUFFIX (Use if applicable):

REVISION: 1

FY: 89

FOR: 160601

DATE: / Nov 89

PI BOX		AIRCRAFT REQUIREMENTS TYPE AIRCRAFT	NUMBER	MONTHS 89 OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
	TEST A/C	YA-7F	FLIGHTS												
			FLYING HOURS												
	SUPPORT AIRCRAFT	A-7D (Note 10)	FLIGHTS										4		
			FLYING HOURS										8		
		F-4 (Note 11)	FLIGHTS												
			FLYING HOURS												
			FLIGHTS												
			FLYING HOURS												
			FLIGHTS												
			FLYING HOURS												
		OTHER REQUIREMENTS													
		Test Management (Note 1)			X	X	X	X	X	X	X	X	X	X	X
		Facilities (Note 2)				X	X	X	X	X	X	X	X	X	X
		Maintenance (Note 3)													
		Range (Note 4)												X	X
		Data Processing (Note 5)												X	X
		Flight Dynamics (Note 6)											X	X	X

AFSC FORM 5341, NOV 86

FIGURE 3.1b (CONTINUED)

TEST CONCEPT/TEST RESOURCE REQUIREMENTS

TITLE	JON
YA-7F Prototype Modification Program	360601

PREPARED BY (Name, organization symbol, extension)	SUPPLEMENT (Enter symbol, if applicable)	REVISION	FY	DATE
			91	

PI BOX	AIRCRAFT REQUIREMENTS		MONTHS										
	TYPE AIRCRAFT	NUMBER	91 OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
	TEST A/C													
	YA-7F	FLIGHTS												
		FLYING HOURS												
	A-7D (Note 10)	FLIGHTS												
		FLYING HOURS												
	F-4 (Note 11)	FLIGHTS												
		FLYING HOURS												
	SUPPORT AIRCRAFT	FLIGHTS												
		FLYING HOURS												
		FLIGHTS												
		FLYING HOURS												
	OTHER REQUIREMENTS													
	Test Management (Note 1)		X	X	X	X	X	X	X	X	X			
	Facilities (Note 2)		X	X	X	X	X	X	X	X	X			
	Maintenance (Note 3)													
	Range (Note 4)													
	Data Processing (Note 5)		X	X	X	X	X	X	X	X	X			
	Flight Dynamics (Note 6)		X	X	X	X	X	X	X	X	X			

AFSC FORM 5341, NOV 86 PREVIOUS EDITIONS MAY BE USED UNTIL EXHAUSTED

Notes for AFSC Form 5341

1. The YA-7F CTF will be manned as agreed to at the 21 Apr 88 manpower meeting. The CTF will begin formal operations in Nov 88.

2. The YA-7F CTF will be located in building 1600. CE is to provide costs for a 9,000 sq ft prefab office within building 1600 as discussed at the Dec 87 TPWG.

3. The YA-7F aircraft will be contractor maintained.

4. Real time TM will be required on all YA-7F sorties. A single 512KB TM stream will be used. One Ridley Mission Control Room with IFDAPS capability will be required on each sortie. High AOA sorties (approximately 30 sorties) will require plot board and radar tracking. Store separation sorties (approximately 10 sorties) will require the use of the PIRA and scoring (either manual or video).

5. First and second generation data processing by RMCC will be required for all test sorties. Areas being examined include performance, propulsion, flying qualities, structures and flutter.

6. Engineering support from the flight dynamics division will be required for the entire program. This includes program management, test planning, test conduct and reporting.

7. Both YA-7Fs will employ ATIS. This system will be provided by AFFTC. The AFFTC will provide as GFE: C-band beacons, ATIS components, the encryption support package, and necessary spares. Instrumentation calibrations will be conducted by ENI at Edwards AFB.

8. Airframe systems will be evaluated throughout the program with emphasis on engine/airframe compatibility, fuel system, molecular sieve oxygen generation system (MSOGS), airframe mounted accessory drive (AMAD), and auxiliary power unit (APU).

9. Specialty engineering support will concentrate on R&M in a monitorship role. Photo support will be required as determined by the CTF director and will include still and motion photography.

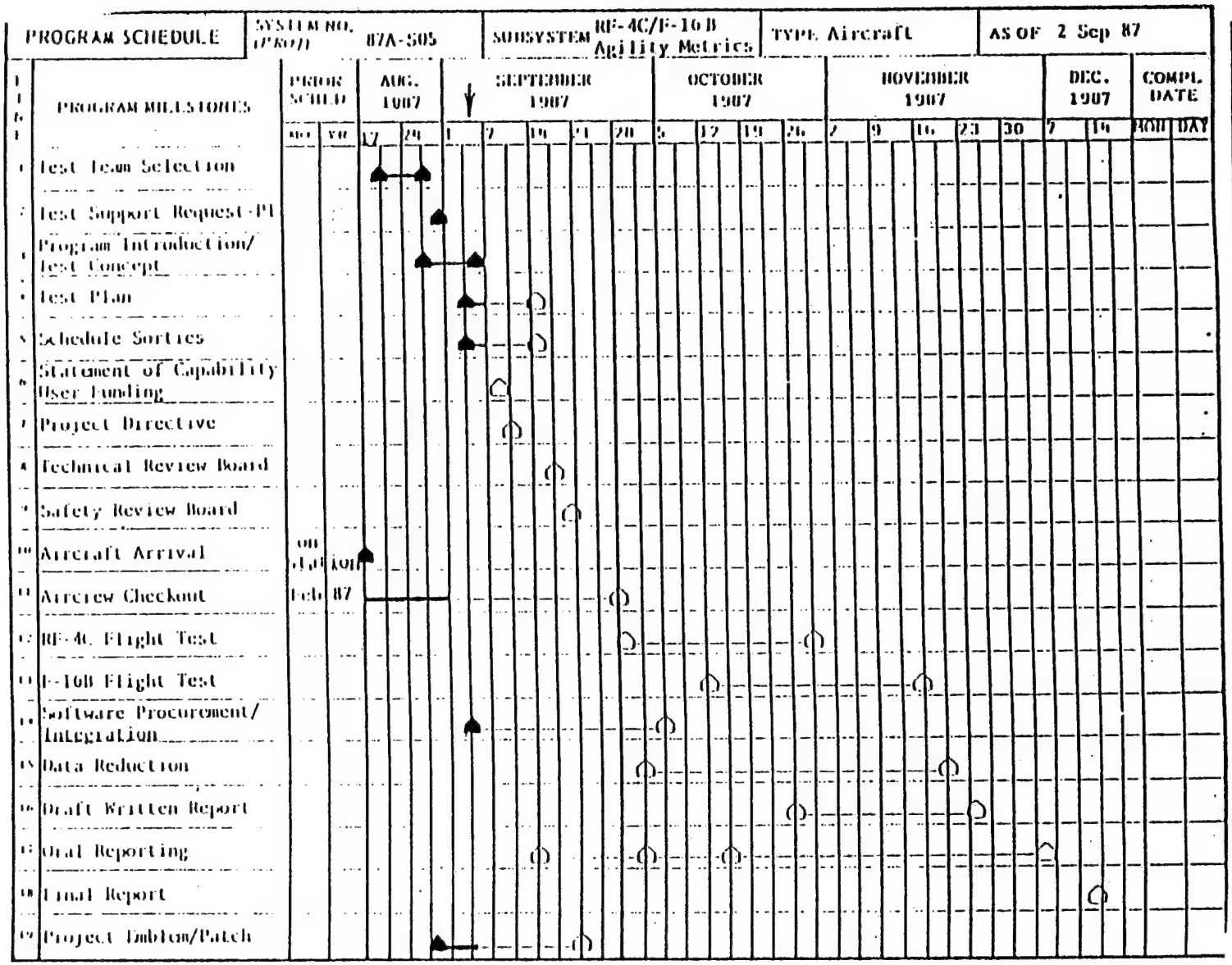
10. The A-7D will be the primary chase aircraft for this program. A-7D sorties/hours also include two round trip ferry flights to Dallas NAS to support safety chase for YA-7F Functional Check Flights. Also included are two local area checkout sorties for each YA-7F contractor pilot. This is a requirement for the contractor pilots to fly

safety chase at Edwards AFB. Eight sorties are also included to provide each pilot with a high angle of attack familiarization flight prior to the high AOA flight test in the YA-7F. The contractor is required to cover the cost of maintaining contractor pilot proficiency prior to the first flight of the YA-7F.

11. The F-4 will be used for pace support, as photo chase, and when high speed chase is required. Round trip ferry flights from Edwards AFB to Dallas NAS are included to provide photo/safety chase support for the YA-7F first flight.

12. Each project pilot is provided a high AOA training sortie in the A-37 (with T-38 chase) prior to the start of high AOA flight test in the YA-7F.

FIGURE 3.1b (CONTINUED)



AFSC [illegible] 103 PREVIOUS EDITIONS ARE OBSOLETE.
MODIFIED

FIGURE 3.1c SAMPLE AFSC FORM 103

TEST MANAGEMENT PROJECT
TEST PLAN

REFERENCES:

1. Test Management Textbook, Chapter 2, "Test Planning."
2. AFFTCR 80-1, Test Plans.

PURPOSE:

To develop and present a Test Plan in accordance with current AFFTC practices.

TYPE OF DOCUMENTATION:

1. Test Plan.

2. AFSC Form 5232b - AFFTC Test Information Sheet (TIS).

The USAFTPS Test Plan format is presented on the following pages. Follow the guidance contained here and on the sample AFSC Form 5232b, which will be submitted with your test plan.

SCENARIO:

During your test management project, once you have an approved Test Concept, you must draft a test plan. This should be easy since you already know your specific test objectives, how you plan to conduct the test, what support is needed, and who will provide it. These are all things you included in your Test Concept. Remember,

> "Test plans contain sufficient information to directly develop flight test cards and for management to discern the overall technical approach being taken. Therefore, test plans are the key documents that describe the specific tests to be accomplished and how they will be accomplished."
>
> AFFTCR 80-1

OBJECTIVE:

As per PID or program introduction letter.

ADMINISTRATIVE ITEMS:

1. The Test Plan is graded.

The most important items here are the objectives! Without specific, concrete objectives you will flounder in the test planning process. The objectives will probably

be the hottest topic of your TPWG. After a successful TPWG, you will be well on your way to a good test plan.

2. The following draft test plans will be due as scheduled:
   a. Draft - 1 copy to your staff monitor for comments.
   b. Updated Draft - 4 copies to Chief of Reports for grade.
   c. Final Draft - 7 copies to Chief of Reports for TRB/SRB. (3 - graders, 2 - Test Wing Engineering Division (DOE), 1 - AFFTC Test Safety (SET))

After your staff monitor has commented on your first draft, your updated draft is submitted for a grade. Next, you incorporate grader comments to make your final draft. Your final draft is exactly the version used at the TRB/SRB.

3. Coordinate with DOE and SET to ensure technical and safety experts will review your test plan and attend your TRB/SRB. The program manager will provide names of DOE and SET individuals contacted to the Chief, Test Management Branch to ensure they were invited to TRB/SRB.

SAMPLE TEST PLAN FORMAT

AFSC Form 5232b used somewhat like a Staff Summary sheet; to explain the gist of the Test Plan and for coordination. A sample is at the end of this format.

TABLE OF CONTENTS

LIST OF FIGURES — (These three lists may be on the same page, if short)

LIST OF TABLES — "

LIST OF ABBREVIATIONS — "

1.0 GENERAL

1.1 INTRODUCTION: — (Who, what, when, where and why)

1.2 BACKGROUND: — (Mention critical technical issues here or refer to appendix)

1.3 RELATED TESTS: — (Both past and future)

1.4 SCOPE: — (Mention maximum number of sorties, if appropriate)

1.5 LOCATION(S):

1.6 CRITICAL DATES AND SUSPENSES:

1.7 AUTHORITY: — (Also reference JON, PID and priority)

1.8 SAFETY: — (Short discussion and refer reader to last appendix)

1.9 SECURITY: — (Look at required regulations and reference them. Partially classified tests need detailed attention here.)

1.10 REPORTING: — (To whom? Will it answer objectives?)

(TEST PLAN FORMAT CONTINUED)

2.0 OBJECTIVES — (Clearly defined? "Success" criteria defined?)

2.1 GENERAL: — (Overall objective for entire program)

2.2 SPECIFIC: — (As separate and unique as possible; put some effort here)

2.2.1 ----
2.2.2 ----

3.0 ORGANIZATION — (Layout for this section will vary, but should cover the listed items in a hierarchical fashion. Including a wiring diagram is often helpful. Make sure you use the correct office symbols!)

3.1 The Requesting Agency is ...

3.2 The Program Office is ...

3.3 The Responsible Test Organization is ...

3.3.1 The Project Manager is ...
3.3.2 The Project Safety Officer is ...
3.3.3 ----

3.4 The Participating Test Organizations are

3.5 The Support Agencies are ...

3.6 ----

(WIRING DIAGRAM??)

(TEST PLAN FORMAT CONTINUED)

4.0 RESPONSIBILITIES AND SPECIAL SUPPORT

(This section is similar to a contract. Get comments from outside agencies before listing their responsibilities here. Use correct office symbols!)

4.1 The Project Manager will:

4.1.1 ----

4.2 The Project Safety Officer will:

4.2.1 ----

4.3 ----

(Support aircraft, Simulation, Range, Facilities, Equipment, Photos, Special data handling, etc. are reasonable subheadings for this section.)

5.0 SCHEDULE

(Tables and diagrams are helpful)

5.1 ----

(General, Phases, Training, Critical Sorties, Priorities, Built-in Stops, Decision Points, etc. are reasonable subheadings for this section. Be able to justify all planned sorties. Include planned success rate for effective sorties.)

(MILESTONE CHART??)

6.0 TEST ITEM DESCRIPTION

(Remember to describe the test item and the test item is not necessarily the aircraft.) (Refer detailed descriptions to an appendix)

(TEST PLAN FORMAT CONTINUED)

6.1 PRIMARY: (Configuration, Production relevance, Software etc)

6.2 Modifications needed

6.3 Supporting items or systems

7.0 INSTRUMENTATION (Refer detailed parameter lists to an appendix)

7.1 GENERAL: (Description, Type, Accuracy, Sensitivity, Calibration, Go-no-go requirements, etc)

7.2 AIRBORNE:

7.3 GROUND:

8.0 TEST CONDITIONS, PROCEDURES, METHODS AND TECHNIQUES (This is the heart of the test plan and should directly relate to the objectives. Please be as descriptive as possible! However, **DO NOT INCLUDE TEST CARDS**, unless you want to reconvene a TRB/SRB or write an amendment when you change them.)

(TEST PLAN FORMAT CONTINUED)

8.1 GENERAL:

8.1.1 ---

8.1.X TRAINING (This is your responsibility!!)

8.1.X SIMULATION: (Everything can and should be simulated to some degree)

8.1.X LIMITATIONS: (Also mention risk of exceeding)

8.1.X TEST ENVELOPE (A picture may help and is usually required)

8.1.X TEST POINTS:

(Long lists belong in an appendix. A test point matrix with each test point listed separately or run table is necessary. Each test point should include, at a minimum, altitude, airspeed or Mach, load factor and test configuration. Each test point should be clearly defined. **Remember, plan test points <u>not</u> sorties.)**

8.1.X Build-up approach, Priorities, Repeats vs statistical significance.

8.1.X Alternate missions, Back-up options (May not be a player)

8.1.X Process or review before proceeding with subsequent sorties

(TEST PLAN FORMAT CONTINUED)

8.2 SPECIFIC:	(Spell these out step-by-step; Conditions, Data band, Procedures, Methods, Techniques, Data Collection, Repeatability, In-flight clearance, etc. Use realistic FTTs, and make sure no limits are exceeded throughout any maneuver i.e. know where you are in the envelope at all times.)
8.2.1 ----	
9.0 DATA PROCESSING, REDUCTION AND ANALYSIS	
9.1 GENERAL:	(Hand recorded, computer, format, data review and turn-around, real-time, data tolerance, data management)
9.2 SPECIFIC:	(How you plan to use the data to support your objectives)
REFERENCES	(AFSCP 127-2, AFFTCR 127-3, etc; Be Thorough!!!)
APPENDIX A (Title)	(Appendices will provide detailed explanations of specific test plan items as required. These may include test profiles, test procedures, data requirements and reduction techniques, instrumentation lists and report requirements.)
APPENDIX X TEST SAFETY REVIEW AND DOCUMENTATION	(This is always the last appendix. Get inputs from your staff monitor and the Unit Test Safety Officer (UTSO). Make sure all hazards identified are test unique!)

(TEST PLAN FORMAT CONTINUED)

X-1.0 SAFETY CONSIDERATION AND PLANNING ACCOMPLISHED

X-2.0 TEST PROJECT SAFETY REVIEW (AFSC FORM 5028)

X-3.0 TEST HAZARD ANALYSIS (AFSC FORM 5028a)

NOTE: GENERAL section (1.1 - 1.10) and remaining 8 major headings are always required. For other than a Qual test plan, REFERENCES and Safety Paperwork (Appendix X) are always required. TABLE OF CONTENTS is only required if it aids reviewing the test plan. Subheadings and other items are flexible depending on your test, but the material should be present in some form. Page numbering in the appendices will include the letter of the appendix and a page number, with the first page of the appendix being A-1, for example. Samples of previous students TMP Test Plans are in the TPS library.

CAUTION: Not all test plans in the TPS library are good examples.

AFFTC TEST INFORMATION SHEET (TIS) 1 Qual TEST PROGRAM	DATE 29 Jan 92	PAGE 1 OF x PAGES
TITLE OF TEST: F-15E Qualitative Evaluation	VEHICLE TYPE: F-15E	TIS NUMBER: Basic
	EFFECTIVITY: N/A	REVISION: Basic

TIS TYPE	LOCATION OF TEST	TESTING ACTIVITY	HAZARDOUS/UNUSUAL TEST
☐ PLAN ☐ PROCEDURAL	Luke AFB	USAF TPS/EDB	No/No

This USAF TPS curriculum test plan was reviewed in accordance with the procedures outlined in USAF TPS OI 51-10 and not specifically in accordance with the instructions contained in AFFTCR 80-1.

(This page is a sample of AFSC 5232B, reduced size. The above statement is mandatory for TPS curriculum test plans. The form's actual uses vary from unit to unit and base to base, but for detailed test plans it serves as an overall cover and coordination page. Think of it as a Staff Summary Sheet. "The form should contain background and authority information and should lead the reader to a better understanding of the test." Continue on the back side if necessary. If you have TRB directed changes to your test plan, please outline them here, for the reviewers' and aprovers' ease. If you amend your test plan, use another of this same form, annotate the "REVISION" block above accordingly, and write out the changes. In this case, you only need signatures of the affected reviewers and the approver. If the form has insufficient signature blocks for all your reviewers, make additional signature blocks above the pre-printed ones. Please use some discretion. For Qual test plans, overtype the bottom REVIEW block as APPROVE for the second approver.)

PREPARING/COORDINATING OFFICIALS			DATE	CONCUR		COMMENTS ADDED	
ACTION	OFFICE SYMBOL	SIGNATURE		YES	NO	YES	NO
PREPARE	EDB						
REVIEW	Staff Monitor						
REVIEW	EDT						
APPROVE	ED						
APPROVE	DO						

AFSC Form 5232b. MAR 88 PREVIOUS EDITION WILL BE USED

AFFTC Test Information Sheet

TEST MANAGEMENT PROJECT FOLDER

REFERENCES:

1. Previous TMP folders - TPS library.
2. Project Managers Handbook.
3. Test Management text.

PURPOSE:

To provide a single source project folder for all project documentation.

TYPE OF DOCUMENT:

The project folder consists of a standard six-sided cardboard folder with metal clips at the top of each section. The six sections contain the following information:

1. Section 1 - BACKGROUND. This section contains supporting documents, receipts, notes, telecon memos, memos for record, meeting minutes/attendance and correspondence.

2. Section 2 - MANAGEMENT INFORMATION. This section contains project directive, statements of capability, test concept (letter with AFSC forms 5341 and 103), program introduction letter, request for test concept, program introduction document and project assignment letter.

3. Section 3 - SAFETY REVIEW. This section contains AFSC Forms 5028b and 5028a, AFSC Form 5028, Safety Review staff summary sheet and SRB meeting minutes/attendance.

4. Section 4 - TEST PLANNING. This section contains the test plan, test plan amendments, AFSC Form 5232b, reference to data management folder, TRB meeting minutes/attendance and TPWG meeting minutes/attendance.

5. Section 5 - BRIEFING SLIDES. This section contains the final oral presentation (PRR), PAR, SRB, TRB and TPWG.

6. Section 6 - FINAL REPORT.

SCENARIO:

Your tasking is to prepare a project folder for your use throughout your test. During your test, it provides the single source for assuring you conduct your test properly, and at the completion of your test, it is the historical reference of you test conduct.

OBJECTIVE:

Keep a clear and concise folder that will allow your project manager to better manage your project.

ADMINISTRATIVE ITEMS:

1. Use card stock to make cover sheets for each section. Each cover sheet should have the section title, as well as an index to the contents in the section.

2. Each section with multiple documents should have each document tabbed for ease of finding.

3. This is a pass/fail document.

REQUIREMENTS:

1. Each project manager will prepare a test management project folder for review by the Chief, Test Management Branch prior to test plan draft submittal.

2. The project manager will maintain the project folder throughout the test.

3. The folder must be available to any staff supervisor at any time (during TPS duty hours 0600-1800) in the project managers mailbox when not in use.

4. Your folder must be kept neat and manageable throughout the project's duration.

5. When the test is completed, the project folder will be turned in to the Chief, Test Management Branch prior to graduation. They will retain the folder for historical documentation.

TEST PLAN WORKING GROUP

REFERENCES:

1. Project Managers Handbook.
2. Test Management Textbook.

PURPOSE:

To meet with your requesting agency, technical experts, staff monitor and other TPS staff members to ensure your objectives and plan will accomplish their goals.

TYPE OF REPORT:

Group Informal Oral

SCENARIO:

You need to meet with your requesting agency (and local technical experts) to let them know your proposed plan for accomplishing the test they requested. This will ensure "everyone is singing from the same sheet of music."

OBJECTIVE:

To have valid objectives and a plan (FTTs, sortie requirements, etc) for accomplishing them.

ADMINISTRATIVE ITEMS:

1. This event is pass/fail.

2. A Test Plan Working Group (TPWG) will be scheduled early in the TMP planning phase. This is not meant to be the last TPWG you should conduct. These should occur throughout the test planning process. The goal of this scheduled TPWG is to get together with your requesting agency, technical experts, staff monitor, and other TPS staff members to ensure you're on the right path. However, this should not be confused with a "concept exploration" meeting in which objectives are developed and discussed. You should come to the meeting with a set agenda meant to address and answer each of the questions below.

   a. What is out overall project goal?
   b. What specific objectives will accomplish our tasking (goal)?
   c. What data do we need to accomplish our objectives?
   d. Which FTTs will provide the data we need?
   e. How many flights will it take to get all FTTs and respective data assuming an 80% test sortie effectiveness? (This does not include pilot upgrade sorties).

f. What support do we need for our flights? Instrumentation, ranges, chase, simulation, Class II mods, etc?

g. Coordinate with technical support to ensure required data reduction capability is available at TPS.

h. If required data reduction capability not available at TPS, determine where data will be processed and coordinate with them. The most important items here are the objectives! Without specific, concrete objectives you will flounder in the test planning process. The objectives will probably be the hottest topic of your TPWG. After a successful TPWG, you will be well on your way to a good test plan.

REQUIREMENTS:

1. Visual aids are not required, but may help the flow of the meeting.

2. PM coordinate TPWG meeting time with all appropriate individuals (requestors, technical experts, technical support, maintenance, etc).

TEST MANAGEMENT PROJECT
TECHNICAL/SAFETY REVIEW BOARD

REFERENCES:

1. AFR 55-30, "Operations Security".
2. AFFTCR 80-1, "Test Plans".
3. AFFTCR 127-3, "Safety Planning for AFFTC Tests".
4. Test Management Textbook.
5. Project Managers Handbook.

PURPOSE:

To obtain project approval from technical and safety standpoint so that flight testing of your project may begin.

TYPE OF REPORT:

Group Informal Oral.

SCENARIO:

AFFTC technical and safety experts want to review and approve your proposed TMP plan so your testing may begin.

OBJECTIVE:

To clearly and concisely present your proposed TMP plan so approval will be achieved easily.

ADMINISTRATIVE ITEMS:

1. A thorough technical and safety review will be conducted by the program manager to ensure that adequate planning and preparation have been accomplished prior to submitting each curriculum test plan for final approval.

2. Preliminary copies of the test plan will be forwarded to review board members no later than three working days prior to convening the board.

3. These final draft test plans cannot change after the board has received them.

4. The technical and safety reviews may be accomplished at the same review board. The review will be conducted by a designated committee comprised of members of the

TPS staff and representative(s) of the AFFTC Safety Office (AFFTC/SE). As required, other technical members from AFFTC, DOE and the test requestor may be invited, but as a minimum, the following individuals will be represented:

a. TPS Commandant (Technical Review Board Chairman) or designated representative.

b. TPS Director of Operations or designated representative.

c. TPS Director of Student Training or designated representative.

d. AFFTC System Safety Officer (Safety Review Board Chairman).

e. Applicable TPS Branch Chiefs.

f. TPS Staff Monitor.

5. A presentation will be made at the start of the review by the test team and should address all aspects of the proposed test program to include: objectives, current program status, limitation, proposed procedures, instrumentation, data requirements, and philosophy for preparing all of the above. Informal discussion following the briefing will recommend changes as necessary.

6. AFFTCR 127-3 Section 6 specifies the content of the presentation to be presented at the start of an SRB. Although we conduct a back-to-back TRB/SRB, the items listed in AFFTCR 127-3 should be covered at the start of the TRB or SRB.

7. This is a graded event.

8. The Test Safety Review Board will assess the risk levels for specific tests. The AFSC Form 5028 will be reviewed and signed. Review board remarks will be entered on the AFSC Form 5028. Attached to it will be a list of board members. The entire AFSC Form 5028 package will be included as part of the final test plan.

REQUIREMENTS:

1. Following the reviews, the preparers of the test plan will make all required changes to the plan. After all review board required changes have been accomplished, final coordination and approval will be initiated. An AFSC Form 5232b will be used to outline all required changes and obtain the signatures of all board members. The form will contain background and authority information for the test and lead the reader to better understand the test plan, similar to a staff summary sheet.

2. In the unlikely event separate technical and safety reviews are accomplished, the technical review will be accomplished first, required changes will be made to the test plan, an AFSC Form 5232b will be prepared, then the safety review will be conducted.

3. An amendment to the TMP test plan is required if the flight test envelope is expanded or if any of the limitations in the test plan are made less restrictive. This requires preparation of an amendment to the safety package (AFSC Form 5028b) as well as preparation of a revised AFFTC TIS (AFSC Form 5232b). Revisions which are within the scope of the original AFSC Form 5028 and make the test plan more restrictive will be documented on an AFFTC TIS (AFSC Form 5232b) and approved by the TPS Directors of Student Training and Operations or their designated representatives. This TIS will be forwarded to the TPS Commandant for his information.

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TEST MANAGEMENT PROJECT
SAFETY REVIEW APPROVAL PACKAGE

REFERENCES:

1. AFFTC Reg 127-3, Safety Planning for AFFTC Tests.
2. Project Managers Handbook.
3. Test Management Textbook.

PURPOSE:

To provide USAFTPS and AFFTC senior management enough project information to approve the project from a safety standpoint.

TYPE OF DOCUMENT:

The safety package consists of a standard six-sided cardboard folder with metal clips at the top of each section. The Safety folder for a new program is as follows:

Section 1 - Staff Summary Sheet
Section 2 - AFSC Forms 5028 and 5028a
Section 3 - Blank
Section 4 - Test Plan and training plan (as applicable)
Section 5 - TRB Minutes and Recommendations
Section 6 - Supporting Documents (as applicable: PI, photos, etc)

The safety folder for an existing program is the same as for a new program except for the following:

Section 2 - AFSC Form 5028b and 5028a
Section 3 - Original AFSC Forms 5028 and 5028a

SCENARIO:

Now that you've completed your TRB/SRB, you need to provide TPS and AFFTC senior management with a summary of test plan and TRB as your project will be approved from a safety standpoint. This summary is in the form of a safety package.

OBJECTIVE:

Develop a clear and concise package that will be easily coordinated.

Date

ROUTING AND TRANSMITTAL SLIP

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. USAFTPS/EDT		
2. /ED		
3. /TS		
4. /DO		
5. /CC (Sign Staff Summary Sheet)		

Action	File	Note and Return
Approval	For Clearance	Per Conversation
As Requested	For Correction	Prepare Reply
Circulate	For Your Information	See Me
Comment	Investigate	Signature
☒ Coordination	Justify	

REMARKS

USAFTPS internal coordination for Test Management Project.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
	Phone No.

5041-102 OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

FIGURE 3.2a USAFTPS INTERNAL COORDINATION FOR TEST MANAGEMENT PROJECT

STAFF SUMMARY SHEET

	TO	ACTION	SIGNATURE (Surname) GRADE AND DATE		TO	ACTION	SIGNATURE (Surname) GRADE AND DATE
1	AFFTC/ SET	Coord		6	6510 TW/ CV	Info	
2	AFFTC/ SE	Coord		7	6510 TW/ CC	Info	
3	USAFTPS/ CC	Approve		8	AFFTC/ CA	Info	
4	6510 TW/ DOE	Info		9	AFFTC/ CCE	Info	
5	6510 TW/ DO	Info		10	AFFTC/ CV	Info	

SURNAME OF ACTION OFFICER AND GRADE	SYMBOL	PHONE	TYPIST'S INITIALS	SUSPENSE DATE
Capt D. G. Carey	USAF TPS/EDA	7-8042	jp	ASAP

SUBJECT: NASP Vector Test Management Project

DATE: 23 Sep 92

SUMMARY

1. PURPOSE: The purpose of this correspondence is to obtain approval of the NASP Vector TPS Student Test Management Project.

2. BACKGROUND: The X-30 research vehicle will need chase and airborne simulator support for future test missions. The F-15B is being considered to fulfill these support needs. This test management project will evaluate how the use of a Head-Up-Display and a vision restricting device simulating the field-of-regard available to an X-30 pilot affect the position and velocity dispersion at flare initiation. The TRB/SRB were conducted on 16 Sep 92 in the 6510 TW Safety Conference Room. The SRB considered the project to be LOW risk.

3. DISCUSSION: Twenty-two F-15B sorties will be flown: nine pilot checkout, one IP evaluation, and 12 data sorties. Flight test techniques used will be sawtooth descents and low lift-to-drag ratio approaches. Both of these techniques are taught in the USAF TPS curriculum.

4. RECOMMENDATION: USAF TPS/CC approve the test project by signing the AFSC Form 5028.

Duane Carey

D. G. CAREY, Capt, USAF
Project Safety Officer

5 Tabs
1. AFSC Forms 5028/5028a
2. Blank (AFSC Forms 5028b)
3. TIS-TPS-92A-015
4. TRB Minutes
5. Supporting Documentation

AF FORM 1768 (COMPUTER GENERATED) PREVIOUS EDITION WILL BE USED.

FIGURE 3.2b TPS STAFF SUMMARY SHEET FOR SAFETY REVIEW PACKAGE

TEST MANAGEMENT PROJECT
DATA MANAGEMENT FOLDER

REFERENCES:

Test Management Textbook, Chapter 2, "Test Planning."

PURPOSE:

To provide a single source project folder for all project data, and to allow you to practice good data management throughout your test management project.

TYPE OF DOCUMENT:

You may manage your data in the standard six-sided cardboard folder with metal clips; however, you may wish to use some sort of filing box if the amounts of data become large.

There is no specific format for your data management folder, as long as it includes all the data (flight cards, test point tracking matrices, raw data printouts, photos, etc), the data must be labeled (date, aircraft, tail number, mission number, JON number), and it must be organized in a friendly manner.

SCENARIO:

During your TMP, you will be collecting data of many types. All of your data must be neatly organized and documented for historical reference for at least 2 years.

OBJECTIVE:

Keep an orderly, organized folder of **all** data collected during your TMP.

ADMINISTRATIVE ITEMS:

1. This is pass/fail.

2. The folder must be available for review by any staff supervisor at any time (during TPS duty hours, 0600-1800) in the project managers mail box when not in use.

REQUIREMENTS:

1. Use a test point tracking matrix to track the progress of your project as you proceed through testing. Use the sample on the next page as a guide.

2. Your folder must be user friendly, and good organization is a must.

Test-Point Tracking Matrix

Test Management Project Title

Test Point and Description	Date Flown/ Tail #	Data Analyzed	Data Quality?	Refly?	Date Flown/ Tail #	Data Analyzed	Data Quality?	Refly?
1.0-Mil Pwr Check Climb (5→30K)	4Feb92/ #059	yes	poor	yes	7Feb92/ #059	yes	good	no
1.1-Stabilized Turns								
1.11-Constant (?Kts) Airspeed 10K/	5Feb92/ #059	yes	good	no				
1.12-Constant 35→ (?Kts) Airspeed 10K	5Feb92/ #059	yes	good	no				
1.13-Constant (?Kts) Airspeed 15K	5 Feb92/ #059	yes	poor	yes	10Feb92/ #075	yes	good	no
1.14-etc.								
1.2-Timed Turns								
etc.								

Note: This is a sample matrix to be used as a guide. Modify it to fit your needs and accomodate your project. Put enough information in the test point description so the matrix is self-explanatory.

This may be handwritten, typewritten or computerized: whichever your group prefers. Remember, keep it user friendly!

AF FORM 3125 TEST-POINT TRACKING MATRIX

TEST MANAGEMENT PROJECT
PROGRAM ASSESSMENT REVIEW

REFERENCES:

1. Test Management Textbook, Chapter 2, "Test Planning".
2. AFFTC Reg 800-23, AFFTC Program Assessment Review.

PURPOSE:

To inform the commandant and staff of the status of Test Management projects.

TYPE OF REPORT:

Group Informal Oral

Briefings should be no longer than five minutes using the following chart/slide formats:

1. Test Objectives. Summarize the test objectives on the slide as shown in Figure 3.3.

2. Program Schedule Status. The Program Schedule Status format is shown in Figure 3.4. Use the same milestones described in the Test Concept. The time blocks may be modified for clarity. Symbology is further explained in References 1 and 2.

3. Schedule Profile. Show your flight hour progress on the slide format shown in Figure 3.5.

4. Management Emphasis. Use Management Emphasis slides (Figure 3.6) whenever a program element is other than satisfactory. Use more than one chart, if required, to clarify situations making the project marginal or unsatisfactory.

SCENARIO:

Brief the PAR as if you are briefing the AFFTC Commander and his staff.

OBJECTIVE:

Present the current status, progress and future plans of your TMP.

ADMINISTRATIVE ITEMS:

1. Visual aids may be hand prepared.

2. Each project will present an introductory PAR near the beginning of the test phase and every two weeks thereafter during the test program.

3. PAR briefings are graded pass/fail and are normally held during the weekly "Ops meeting" in the auditorium. When PAR's are on the agenda, all groups should be prepared to brief.

REQUIREMENTS:

Since the briefing is only 5 minutes long use only one person from the group to brief. Use a different briefer for each PAR.

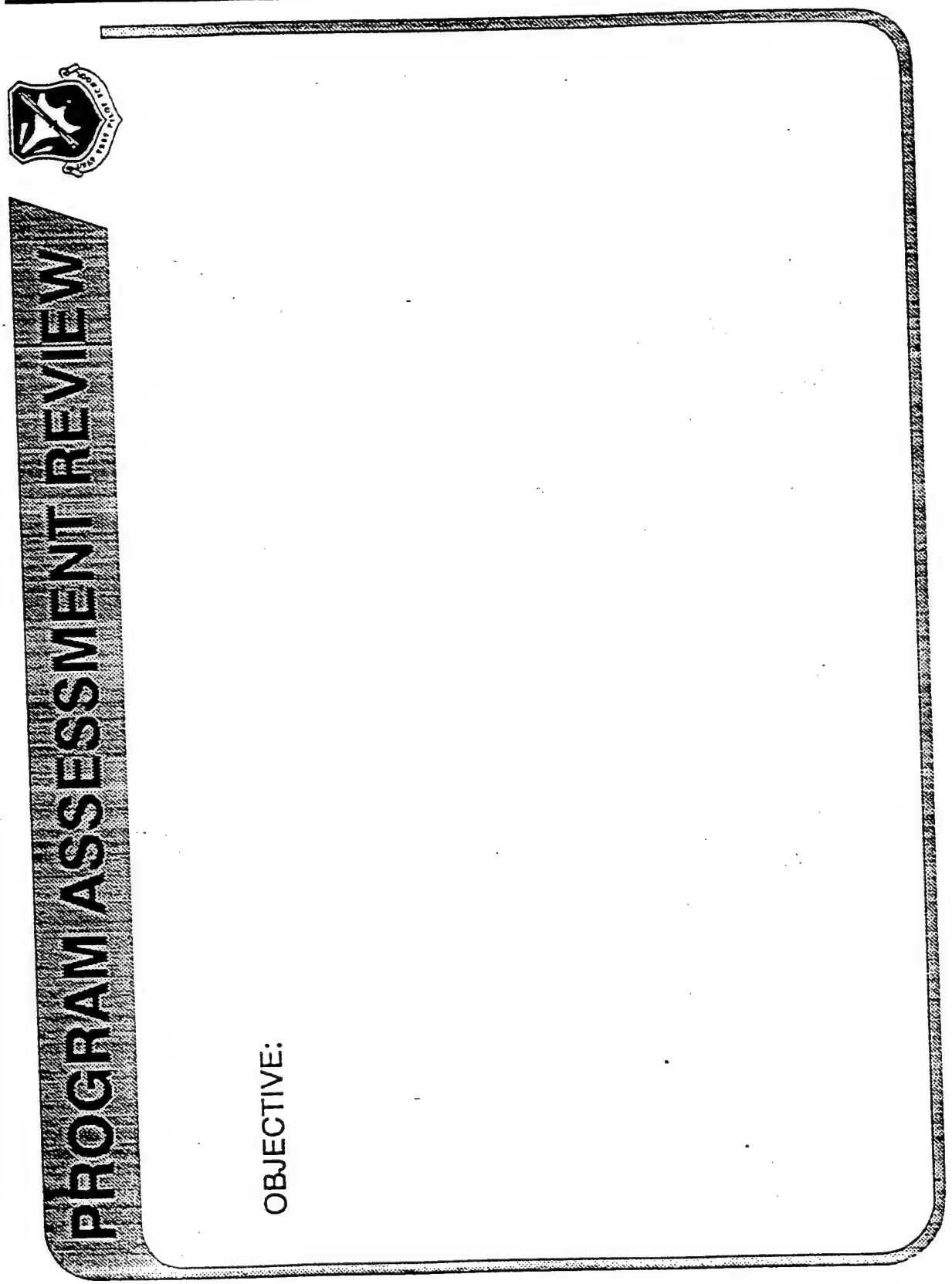

FIGURE 3.3 PAR OBJECTIVES

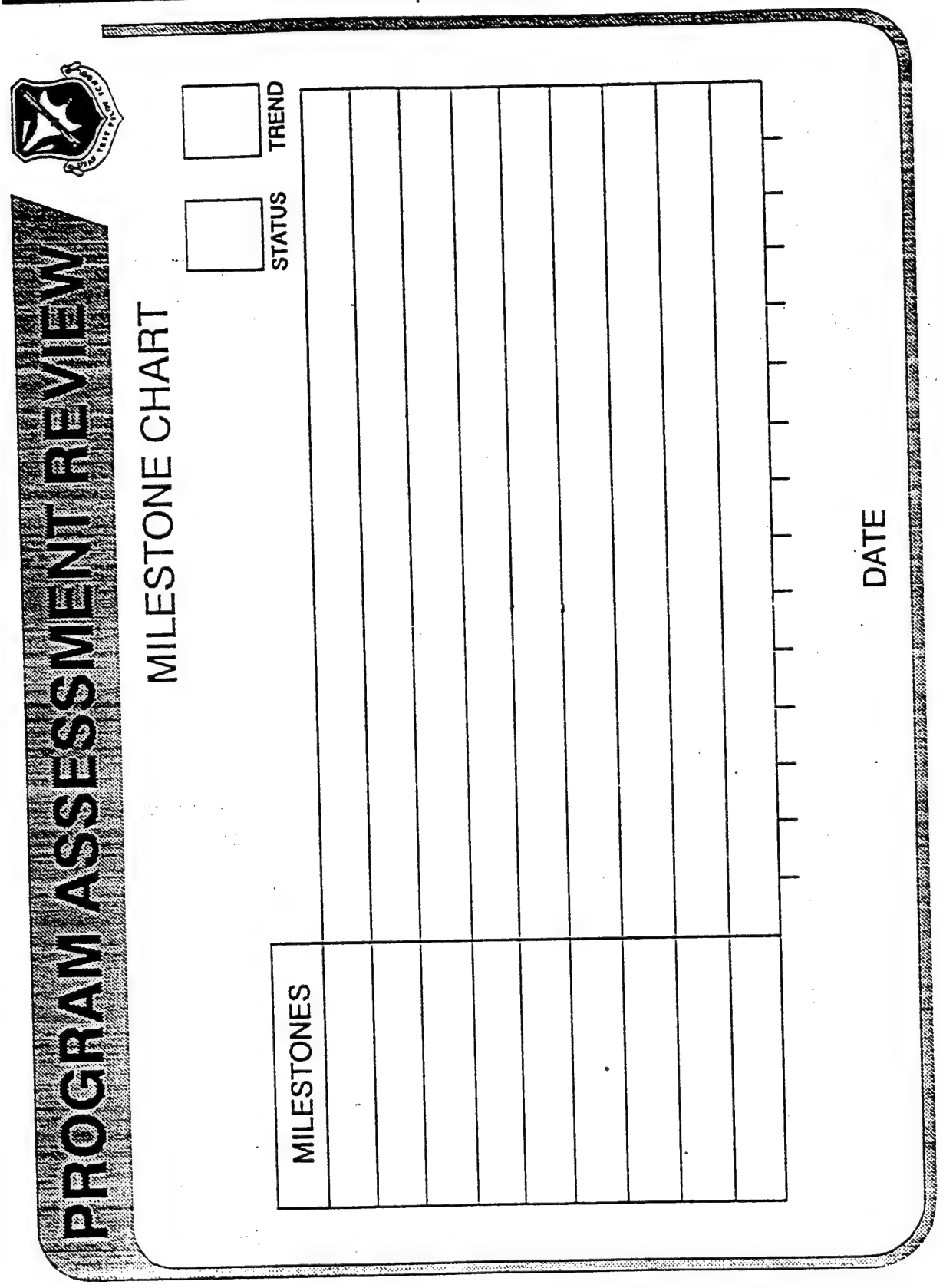

FIGURE 3.4 PAR MILESTONES

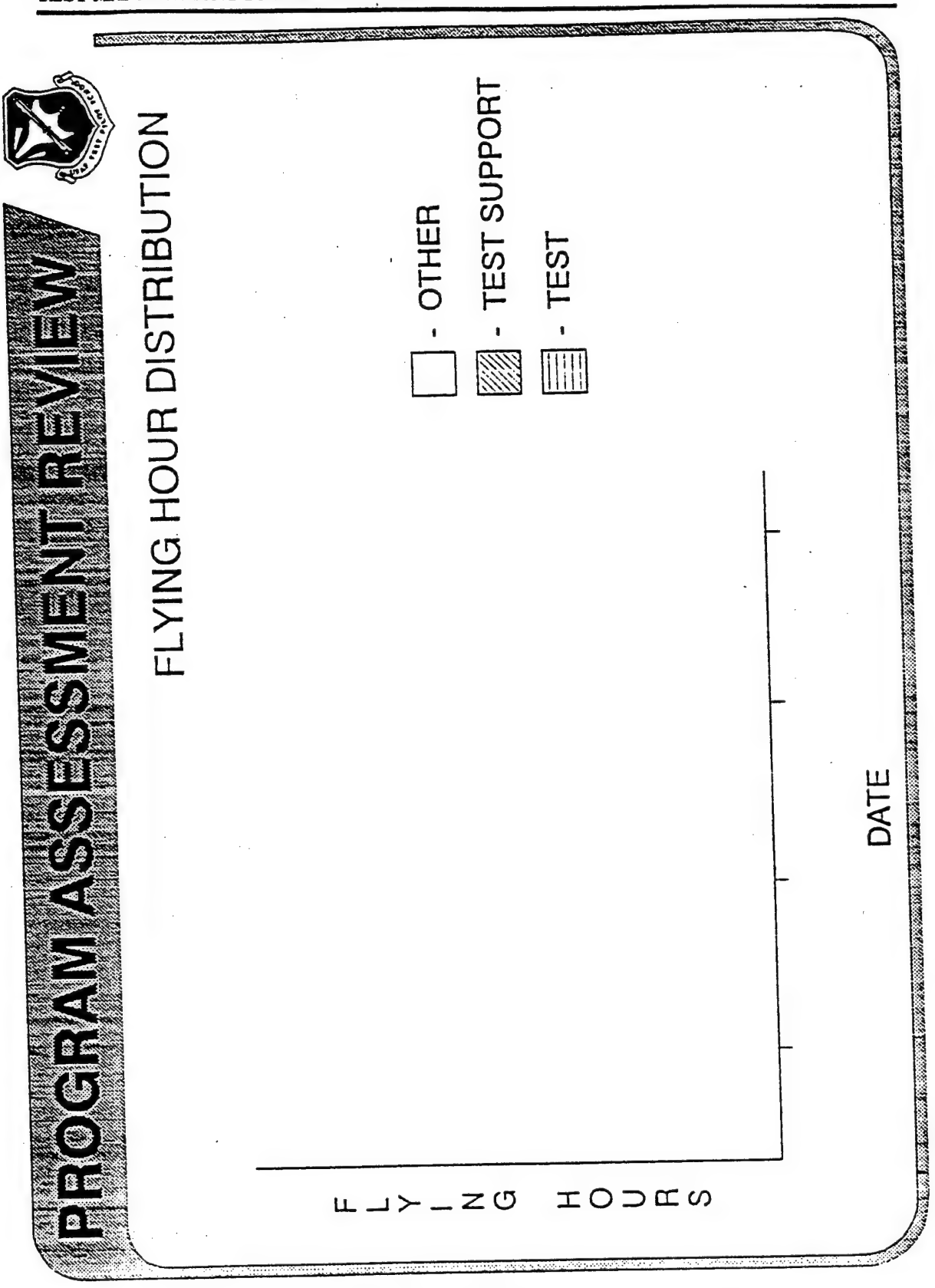

FIGURE 3.5a PAR FLYING HOUR DISTRIBUTION

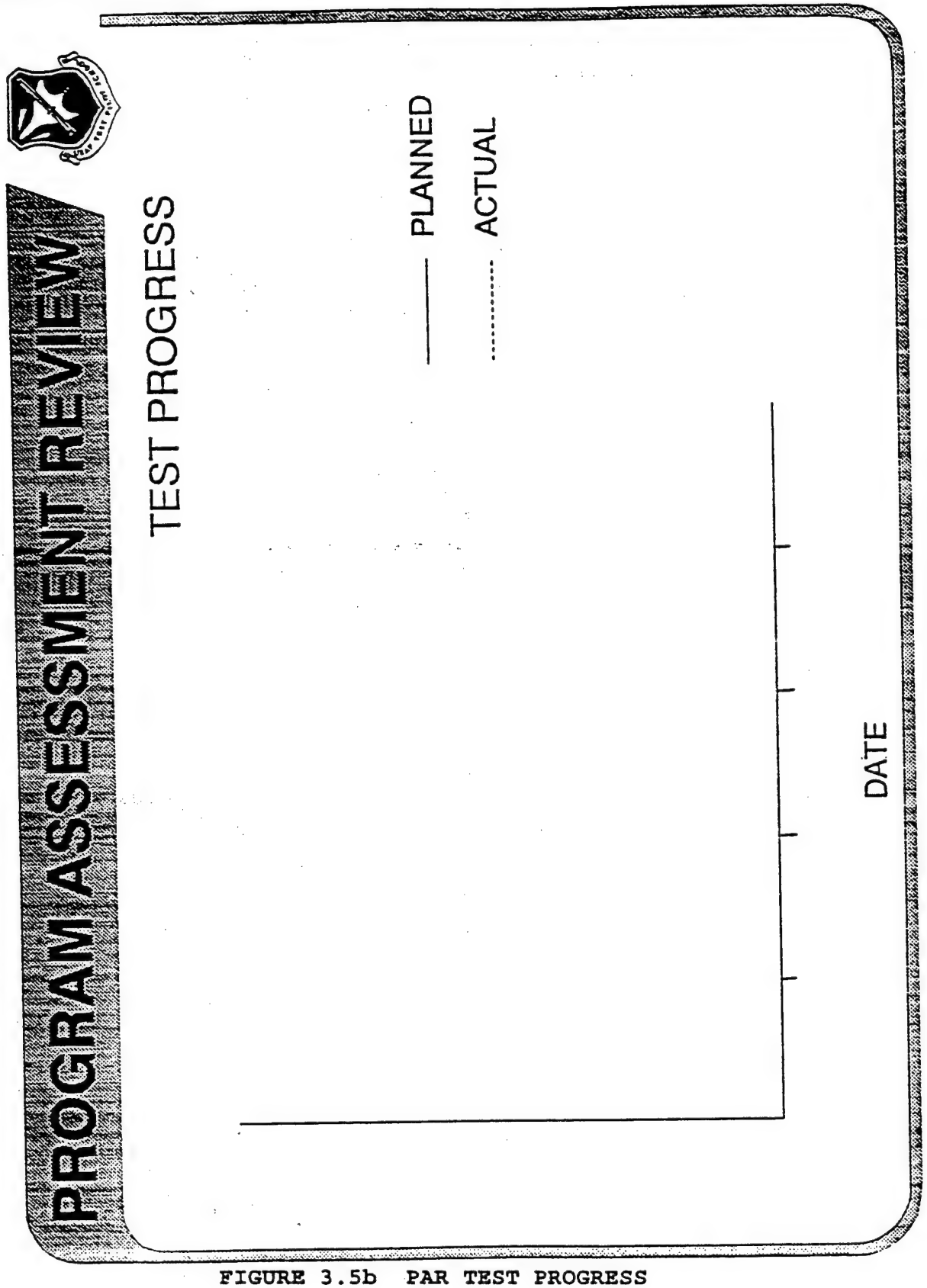

FIGURE 3.5b PAR TEST PROGRESS

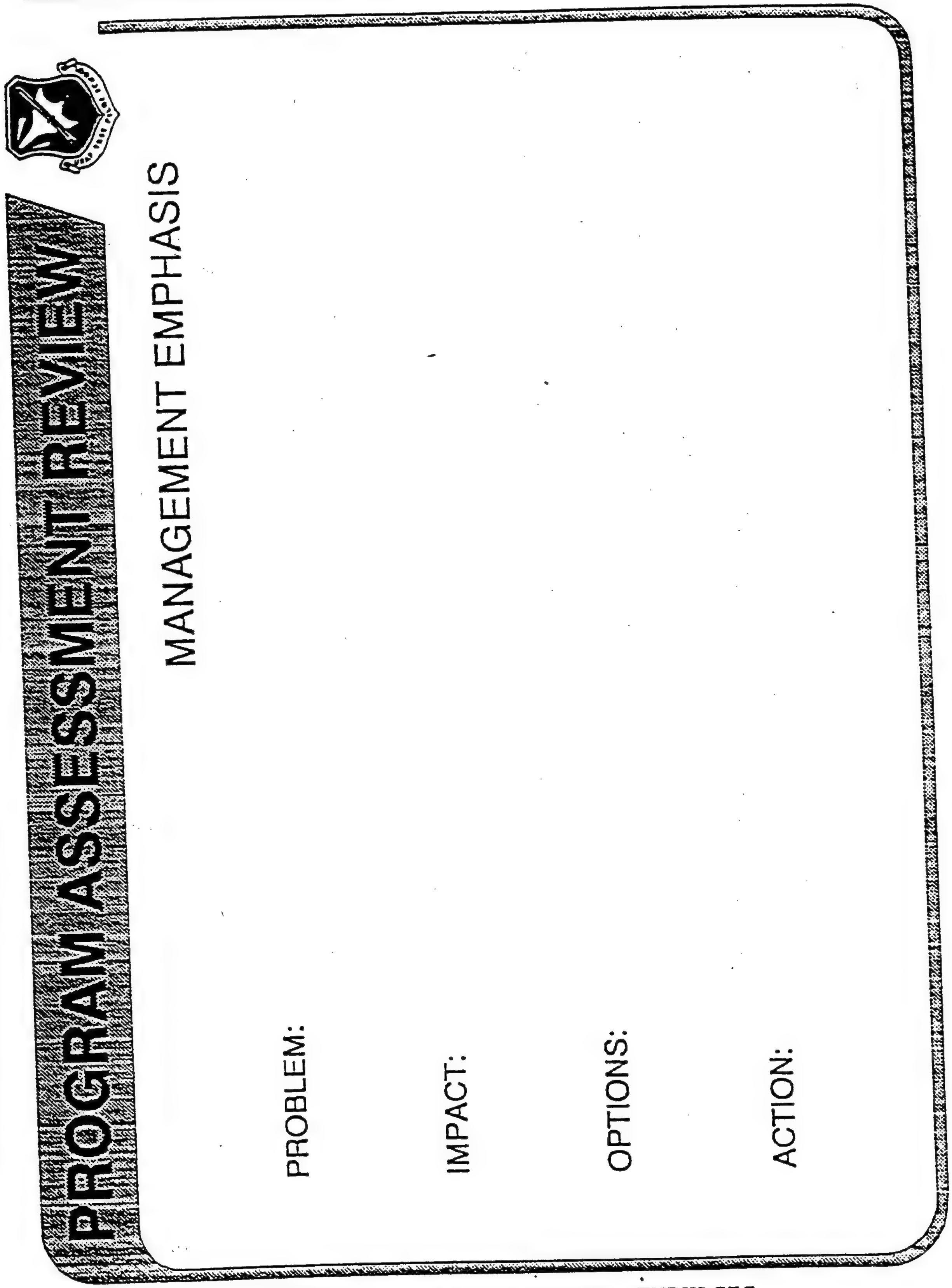

FIGURE 3.6 PAR MANAGEMENT EMPHASIS

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PRE-WRITER'S MEETING

REFERENCE:

1. Project Manager's Handbook.
2. The Author's Guide to Writing Technical Reports.
3. Your TMP Test Plan.

PURPOSE:

To meet with 412TW Engineering Division (DOE) representatives and the TPS Chief of Reports to get face-to-face feedback on your report outline before you start writing the final draft.

TYPE OF REPORT:

Group Informal Oral. There is no specific format for this meeting.

SCENARIO:

You need to meet with 412TW Engineering Division representatives to discuss what you plan to write in your TMP report. This is a normal requirement for any technical report being written at the AFFTC.

OBJECTIVE:

To present a very detailed, comprehensive outline of your TMP report.

ADMINISTRATIVE ITEMS:

1. This is pass/fail.

2. Items presented may be handwritten.

REQUIREMENTS:

1. The project manager must schedule this meeting with AFFTC Engineering Division representatives and the Chief of Reports, and make sure there is space here at the school for the meeting.

2. Your outline should include but is not limited to, a list of prospective plots with one sample as well as possible conclusions and recommendations.

3. Be prepared to explain all that you present.

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TEST MANAGEMENT PROJECT TECHNICAL REPORT

REFERENCES:

1. The Author's Guide to Writing AFFTC Technical Reports.
2. Your TMP Test Plan.

PURPOSE:

To present the results of your test management project.

TYPE OF REPORT:

Group Final Written and Group Formal Oral

SCENARIO:

You have just completed the analysis of your TMP data and you must present your results to the requesting agency and the AFFTC commander in a formal technical oral and written report.

OBJECTIVE:

Present your data in a clear, concise and logical manner in your written as well as your oral technical report.

ADMINISTRATIVE ITEMS:

1. The Group Final Written is graded.
2. The Group Formal Oral is graded.
3. The Group Formal Oral is presented in service dress or equivalent.

REQUIREMENTS:

Written

1. The final product for the test management project will officially be an AFFTC Technical Letter Report (TLR). However, your report is actually a technical report with the only exception being the use of a TLR number for reduced signature cycle. Your report will go through the same review process as any other AFFTC TLR. This process is outlined in Figure 3.7. Remember, this should contain all the required sections of the AFFTC technical report, and it should be of publication quality.

2. You may submit a draft version of your report to your staff monitor for review prior to submitting your final draft for grading and the Technical Coordination meeting.

Oral

1. The oral report should be consistent with the published written report and should be in the format of Preliminary Report of Results (PR^2). The presentation slide should be on the top half of the page and the narrative should be on the bottom half.

2. Slides must be presentation quality.

3. It is desired that all members of the group participate in the presentation. However, some projects will be smaller scale than others, making it difficult for everyone to speak.

4. Limit the length of the presentation to 50 minutes. Don't use filler to make it last this long. If your topic can be covered sufficiently in 20 minutes, then do so.

5. Invite the customer and other interested Edwards personnel to attend your briefing. The date will be scheduled about 3 weeks prior to the briefing.

6. All groups will attend all presentations.

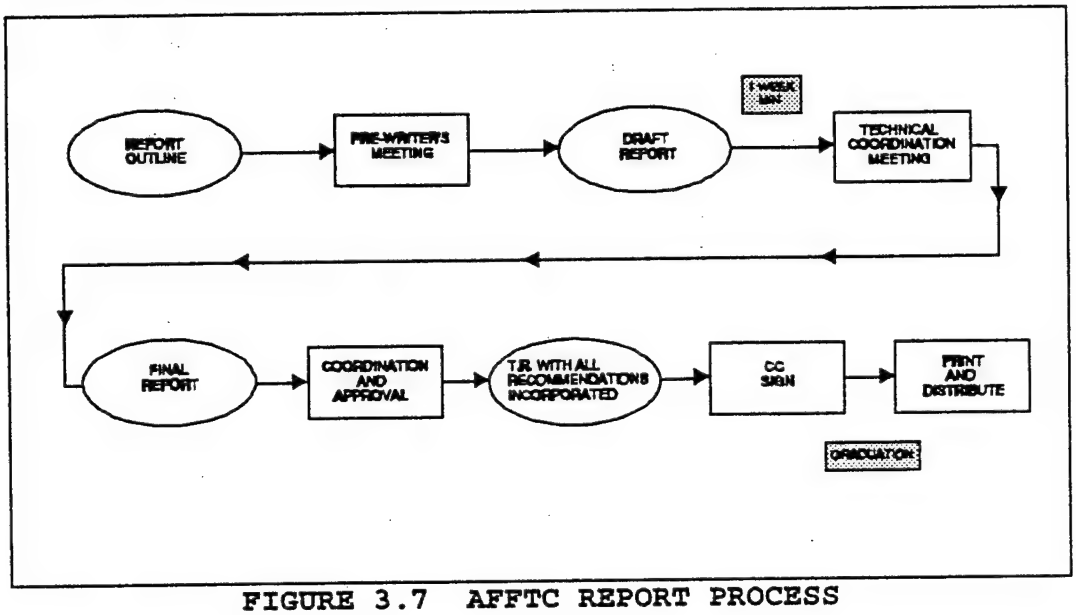

FIGURE 3.7 AFFTC REPORT PROCESS

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TECHNICAL COORDINATION MEETING (TCM)

REFERENCES:

1. The Author's Guide to Writing AFFTC Technical Reports.
2. Your TMP Test Plan

PURPOSE:

To provide a thorough AFFTC technical review of your report prior to publication.

TYPE OF REPORT:

Group Informal Oral

SCENARIO:

You have submitted your final draft to the 412TW Engineering Division for review and you must now meet with them to get their comments.

OBJECTIVE:

To understand and incorporate the comments and corrections provided at the TCM.

ADMINISTRATIVE ITEMS:

1. This event is pass/fail.

2. This is a final draft complete with all tables and figures.

3. Minimal ink corrections are acceptable for the final draft.

4. Turn in 4 copies of the final draft report to the Chief of Reports. Also give copies to your staff monitor and your 412TW Engineering representative.

REQUIREMENTS:

1. The project manager must schedule the TCM at least 5 working days after the final draft report is due. Make sure there is space here at the school for the meeting. Coordinate the scheduling of this meeting with the Test Management Branch Chief.

2. All comments, recommendations and corrections from the TCM must be incorporated in your report before the final version is submitted for signature. The review cycle for your report will be briefed.

3. Your report must be signed prior to graduation.

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SECTION IV
TEST MANAGEMENT FLYING TRAINING
A-37B QUALITATIVE EVALUATION DEMONSTRATION (PILOTS, FTE/N)

REFERENCES:

1. Test Management Textbook, Chapter 11, "Qualitative Flight Testing."
2. Flying Qualities Textbook, 14.12.4 through 14.12.6, "Flight Tests."
3. T.O. 1A-37B-1, A-37B Flight Manual.
4. MIL-STD-1797A, Flying Qualities of Piloted Aircraft
5. MIL-STD-203F, Aircrew Station Controls and Displays.
6. USAFTPS Dragonfly Guide and A-37 Pilot Information Cards.
7. USAFTPS OI 51-9, Non TPS Aircraft Qualitative Evaluations.
8. USAFTPS OI 60-7, G Induced Loss of Consciousness (GLOC) Policy.
9. "TPS Reports Requirements," (Test Management Phase Planning Guide, Section III).

PURPOSE:

To demonstrate and practice the techniques and tests required to perform a limited or single flight qualitative evaluation of an aircraft.

AIRCRAFT:

A-37B

EVALUATION MISSION:

Determine the operational suitability of the A-37B as:

1. Fighter Background: Primary Mission - Forward Air Control (FAC). Secondary Mission - Close Air Support (CAS).

2. Multi Background: Primary Mission - Basic Trainer. Secondary Mission Proficiency Trainer.

GENERAL:

1. A qualitative evaluation (qual eval or "qual") is a limited flight test program conducted to determine an aircraft's suitability to perform a particular mission. Since the number of sorties is usually very limited, the test pilot must be knowledgeable of both the aircraft and the mission and thoroughly prepared for the flight phase.

Extensive preflight preparation is essential and should include flight manual study, determination of mission related tasks, profile planning, and cockpit time.

2. The performance, flying qualities and systems should all be evaluated. Specific objectives of the test program and the intended mission will dictate how much time is devoted to each area. For this introduction to qual testing, primary emphasis will be placed on performance and flying qualities as they relate to overall mission suitability.

3. Included as part of the mission is the demonstration (if necessary) and practice of air-to-ground simulated dive bomb, rocket and strafe patterns to evaluate tracking capability. This evaluation is included to provide instruction to students with no background in this particular operational task for use in curriculum qual eval flights.

4. Refer to Reference 1 for further guidance on how to prepare and conduct a qual eval mission. Remember: Primary emphasis should be on relating both qual comments and quantitative data to mission suitability. Be objective in your evaluation and answer the primary question: "Will it do the mission as a FAC/CAS/ Basic Trainer aircraft?"

LIMITATIONS:

The Flight Manual restrictions will apply. Specific mission and aircraft limitations include the following:

1. Approach to Stall:

a. No asymmetric fuel load. (A maximum of 70 lbs difference in wing fuel reading).

b. Recovery will be initiated at the first indication of the buffet.

c. Recovery will be completed by 10,000 ft AGL.

2. Stalls:

a. No asymmetric fuel load (a maximum of 70 lbs difference in wing fuel reading).

b. Recovery will be initiated when the pilot has a clear indication of:

(1) A definite G break, or

(2) A rapid uncommanded angular motion, or

(3) The aft stick stop having been reached and Angle of Attack (AOA) not increasing, or

(4) Sustained intolerable buffet.

c. Recovery will be completed by 10,000 ft AGL.

d. Ensure both engines advance together during recovery in order to prevent a yawing moment due to asymmetric thrust.

e. Abrupt stalls and vertical stalls will be avoided.

3. Engine limitations:

a. RPM will not be reduced below 70% at airspeeds below 150 KIAS above 15,000 ft MSL, except for engine rollback demo.

b. Refer to Section VI of the Flight Manual for engine rollback and compressor stall procedures.

c. Engine RPM will be set at 65% minimum for all stall investigations.

4. No aerobatic maneuvers will be performed below 5000 ft AGL. Use the TPS A-37B Aircrew Aid for aerobatic maneuver parameters.

5. Low level navigation and simulated dive bomb, rocket and strafe passes will be limited as follows:

a. No straight ahead attacks below 5000 ft AGL.

b. Maximum dive angle - 45°.

c. Minimum altitude for low level flight - 500 ft AGL.

d. Minimum altitudes for dive attacks:

TABLE 4.1
A-37 WEAPON DELIVERY NUMBERS FOR MK-82

		BASE		REL		
	MILS	ALT (AGL)	A/S	ALT (AGL)	A/S	AOD
LEVEL	456	3.2	290	---	---	---
30°	233	7.1	200	4.3	285	2600'
40°	153	8.1	200	4.3	285	1300'

e. Simulated release altitudes must be adjusted so as not to descend below the specified minimum altitudes during the dive recovery.

6. No intentional flight with an engine shutdown below 10,000 ft AGL.

7. Min-run landing rolls will not be performed due to the potential for hot brakes and blown tires. The Flight Manual min-run approach procedure may be flown to the touchdown point.

8. IP will brief spin recovery and engine rollback procedures.

9. No abrupt aileron rolls will be flown with tiptank fuel above 280 KIAS.

OPERATIONAL MISSION OVERVIEWS:

1. Primary Mission - FAC Aircraft
   a. Aircraft Systems Required:
      (1) One UHF Radio (Fighter Control)
      (2) Two FM Radios (Ground Commander Comm)
      (3) One VHF Radio (Helicopter Coordination, Backup Comm)
      (4) One HF Radio (Air Request Net)
      (5) Gun sight
      (6) Weapons Release System
      (7) ECM System, Threat Warning System, Flares, Chaff (high threat)
      (8) Secure/Anti-jam Comm
   b. Configuration:
      (1) Four External Fuel Tanks
      (2) 2 x LAU-68 Rocket Pods (14 white phosphorous rockets total)
      (3) GAU-2B/A 7.62mm mini gun (mounted in nose) with 750 rounds
   c. Mission Profile:
      (1) Time (2-3 hours)
      (2) Takeoff from Forward Operating Location (FOL)
      (3) Cruise (single engine) at altitude
      (4) Loiter (single engine) while coordinating with ground forces. In high threat area, loiter may have to be at low altitude (dual engine).
      (5) Air Strike Control (two engines)
         (a) High Threat
         (b) Low Threat
      (6) Loiter and reattack, as required
      (7) Communications Relay (comm jam environment)
      (8) Cruise
      (9) Instrument Flight
      (10) Land
         (a) Short Field (at FOL)
         (b) Small Arms Avoidance Pattern (low threat, nonsecure airfield)

(11) Rapid turn-around time.

d. FAC Requirements

(1) Low Threat (solo)

(a) Nav - must have room for many 1:50,000 scale maps, frequently using 3 or 4 maps at the same time.

(b) Strike Control - near optimum loiter speed, orbit target, keep fighters in sight.

(c) Target Marking - 30° to 45° dive, minimize altitude loss, minimum airspeed delivery, not for accuracy but to stay out of threat environment.

(2) High Threat (dual)

(a) Navigation (low level to target area)

(b) Strike Control - stand-off, low level orbit in safe area, terrain masking, figure 8 pattern to keep fighters in sight. Airspeed maintained near corner velocity for threat avoidance and optimum maneuverability.

(c) Target Marking - low level run in to a pop-up dive delivery or to a shallow loft delivery. Recovery from pop-up or loft to low level flight is critical to avoid excessive exposure time. Run in speed near maximum ordnance carriage/delivery speed.

2. Secondary Mission - CAS

a. Aircraft Systems Required:

(1) One UHF (comm)

(2) One FM (backup)

(3) Gun sight

(4) Weapons release system

b. Configuration:

(1) MK-82s, CBU-52/58, rockets, napalm, 7.62mm mini gun (single or mixed load)

(2) Fuel tanks as required

c. Mission Profile (typical)

(1) Time - 0.8 to 1.5 hours

(2) Takeoff (from FOL)

(3) Cruise/loiter

(4) Rendezvous with FAC

(5) High or low threat deliveries

(6) Cruise

(7) Instrument flight

(8) Landing (at FOL)

3. Primary Mission - Basic Trainer
   a. Aircraft Systems Required:
      (1) UHF or VHF comm
      (2) TACAN or VOR
      (3) ILS
      (4) Selective Identification Feature (SIF)
      (5) Instrument Flight Rules (IFR) capability
   b. Configuration - Clean (tip tanks and eight pylons)
   c. Mission Profile:
      (1) Time - 1.2 hours
      (2) Takeoff
      (3) Cruise to operating area
      (4) General handling and aerobatics
      (5) Instrument flight
      (6) Enroute/penetration descent
      (7) Multiple traffic patterns
   d. Mission Events:
      (1) Military (mil) power climb
      (2) Stalls
         (a) Clean - 1 G and accelerated
         (b) Traffic pattern stall series
      (3) Aerobatics
         (a) Chandelle
         (b) Lazy Eight
         (c) Aileron Roll
         (d) Barrel Roll
         (e) Cloverleaf
         (f) Loop
         (g) Immelmann
      (4) Unusual Attitude Recoveries
         (a) Vertical recovery
         (b) High speed dive recovery
      (5) Basic/Advanced Instruments
         (a) Heading changes
         (b) Vertical S

(c) Instrument descent
(d) TACAN point to point
(e) TACAN/VOR holding
(f) TACAN/VOR/ILS/PAR/ASR/ADF APPROACHES

(6) Descents
(a) Normal
(b) Max range

(7) Traffic Patterns
(a) Straight-in
(b) Overhead
(c) Closed
(d) Simulated emergency patterns:
1) Simulated single engine
2) No flap
(e) Simulated Flame Out (SFO)

4. Secondary Mission - Proficiency Trainer (including ground attack)
a. Aircraft Systems Required:
(1) UHF
(2) TACAN, VOR and Instrument Landing System (ILS)
(3) SIF
(4) IFR capability
(5) Gun sight
b. Configuration - Clean, or with up to four aux pylon tanks
c. Mission Profile:
(1) Time - 1.2 to 2.0 hours
(2) Takeoff
(3) IFR Cruise on Airways
(4) General handling and aerobatics
(5) Roll in deliveries from box pattern
(6) Holding/enroute descent
(7) Multiple instrument and visual approaches at a cross-country base.

MISSION EVENTS:

1. Mission Planning/Data Cards.

a. The student will plan the profile. Events described below are typical but should not be treated as definitive or all inclusive. Closed loop tasks should be designed with adequate and desired performance criteria so that pilot ratings can be

assigned in flight. Plan to get quantitative data as necessary to support qualitative comments and pilot opinion on mission suitability.

b. The flight should be planned with more events than you expect to be able to accomplish, but with a priority order. Use transitions to gather data so time is not wasted.

2. Briefing.
The student will brief the mission. The IP will brief simulated air-to-ground attacks if necessary.

3. Cockpit Eval.
A brief cockpit eval will be conducted. Items to include are ease of entry, crew seating, general layout, location and accessibility of controls and instruments and Field of View (FOV). If scheduling is a factor this portion can be done prior to the actual mission. The IP doesn't have to be present except for the demo portion.

4. Ground Ops.
Evaluate the start and other before taxi procedures. During taxi, evaluate directional control, braking sensitivity, power required and taxi speed.

5. Takeoff.
Use the Flight Manual techniques and evaluate takeoff performance (takeoff roll, V_{NWLO} and V_{TO}) as well as handling qualities such as directional control, stick force and deflection to rotate, Pilot Induced Oscillation (PIO) tendency and trim changes.

6. Climb.
Climb to an altitude, as directed by your profile, using the Flight Manual schedule and evaluate pilot workload required to maintain this schedule. Performance data should include time, fuel and distance to climb. The climb out is a good time to get a general feel of the airplane in all axes. You can check roll response (stick force, adverse yaw, rates), directional stability and short period characteristics without appreciably affecting the climb data. Additionally, note the FOV and assess operation of comm, nav and environmental systems.

7. Operational Task Eval.
Accomplish representative tasks including not only operational handling type events, but also specific mission tasks required in the conduct of the planned mission. For example, a low level route, pop-ups and close/tactical formation would be appropriate tasks for the FAC/CAS mission. BE ABLE TO RELATE HANDLING QUALITIES TO FTT's AND VICE-VERSA. For example, if you are having trouble tracking in the

pitch axis you might want to investigate the F_s/n or short period mode; or, if heading control is difficult during a GCA or ILS approach you might want to use the Dutch roll FTT to investigate the Dutch roll characteristics. Performance data is also critical. For example, RPM and fuel flow at typical low level ingress speed, RPM and fuel flow at low level Vmil, and RPM and fuel flow at loiter speed are important data for the FAC/CAS mission.

In addition, assess the operational suitability of comm, nav, and weapons systems. For simulated dive bomb demo and practice (if necessary), use the gun sight reticle (170 mils) for tracking and the following parameters:

a. Roll-in to a 30° dive bomb delivery from 2500 ft to 3000 ft above release altitude and 200 KIAS.

b. Release at 3000 ft AGL minimum, 300 KIAS, and use a 4 G in 2 secs recovery.

c. Practice tracking tasks. Use a sight setting of 25 Mils to minimize pendulum effect.

8. Cruise.

a. Trim at recommended cruise speed and note OAT (if available), RPM and fuel flow. Evaluate flight controls for trimmability, backlash (free play), friction and breakout, and stick centering.

b. Evaluate performance and flying qualities for baseline data. Further evaluation should be done later (as required) at mission critical flight conditions.

(1) Dynamics - look at the short period, Dutch roll (aug on and off) spiral and roll mode. Time permitting, look at the phugoid, especially if there seems to be a persistent need to retrim to hold altitude.

(2) Static stability - look at speed stability and Steady Heading Sideslip (SHSS) characteristics.

(3) Maneuvering stability - look at stick force per G (F_s/n). This can be done on an opportunity basis such as turning for area orientation and, if power effects are insignificant, combined with the turn performance FTT to look at mil power sustained turn capability.

c. Closed loop tasks - assess pilot workload during typical cruise tasks such as changing altitude or heading.

d. Single engine cruise - repeat those items above that will be affected and also evaluate the airstart procedure.

9. Stalls.

a. Aircraft stall characteristics should be evaluated in both PA and cruise configurations as applicable to the mission. The evaluation should be oriented more towards a contact ride traffic pattern stall series, as opposed to an approach to stall investigation flight test technique.

b. Stalls greater than one g should be evaluated if applicable to the mission. Once again, emphasis should be overall aircraft handling, stall warning and stall characteristics. Precise stall speed determination is secondary to overall qualitative opinion of the characteristics as they relate to the mission.

10. Maneuvering Characteristics.

a. Closed loop - assess pilot workload during representative tasks such as aerobatics, tracking a target g, etc. Relate both open and closed loop tasks to operational suitability.

b. Open loop - at representative flight conditions (10,000 ft/250 KIAS), look at stability and control FTTs as done for cruise with emphasis on stick force per g (F_s/n), control harmony, turn performance, and roll rates.

c. Normally conduct closed loop tasks first to identify flying quality deficiencies, then use the open loop FTTs to further evaluate and document the deficiencies.

11. Air-to-Ground Handling Qualities Tasks.

a. The IP will demonstrate techniques for evaluating aircraft handling qualities during air-to-ground representative tasks.

b. Practice the above demonstrated techniques.

12. Descent Characteristics.

Evaluate performance (rate of descent, fuel flow, etc.) and handling qualities (trim change, stick forces, buffet, tuck tendency) for the following:

a. Max range descent (idle, 140 KIAS)

b. Flight Manual descent (idle, 200 KIAS)

c. Instrument penetration descent (70% RPM, 230 KIAS, speed brake out)

d. Limit dive/tactical descent (idle, 0.7 Mach, speed brake as required)

13. Approach/Landing.

a. Fly an instrument approach using Flight Manual procedures. Evaluate the systems and assess pilot workload during tasks such as following ILS steering, maintaining approach speed, etc. Note open loop items such as power requirements, trim changes, trim rates, stick forces, fuel required, sink rate, crosswind capability, etc.

b. Go around.

c. Normal pattern.

d. Touch and go.

e. SFO pattern.

f. No flap pattern.

g. Simulated single engine pattern - assess performance, trim requirement and go around capability.

h. Closed pattern.

i. Full stop - note touchdown speed, ease of directional control, braking characteristics and landing roll.

14. Post Flight.

Complete the cockpit eval and assess taxi turn radius, ease of ground handling, shutdown procedures and egress.

15. Debrief.

a. Pilot: Debrief the IP on the overall qualitative evaluation of the aircraft. Highlight specific areas of performance and flying qualities investigated and relate them to the operational suitability of the A-37B as a FAC/basic trainer aircraft. Support qualitative pilot opinion with quantitative data (when possible). Consider both ground and airborne ops, procedures, failure states, crew coordination, etc.

b. IP: Debrief the overall mission with emphasis on preparation, planning, mission conduct, stalls, operational suitability eval and student's ability to conduct an adequate qual eval.

INSTRUMENTATION:

1. Tape Recorder.

2. Stopwatch.

DATA REDUCTION:

None.

REQUIRED REPORTS:

An Individual Daily Written Report is due to the instructor pilot five working days after the flight. See Section III of this guide for details.

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QUALITATIVE EVALUATION FLIGHTS (PILOTS, FTE/N)

REFERENCES:

1. Test Management Textbook, Chapter 11, "Qualitative Flight Testing."
2. Flying Qualities Textbook, Sections 14.12.4 through 14.12.6, "Flight Tests."
3. USAFTPS OI 60-7, G Induced Loss of Consciousness (GLOC) Policy.
4. MIL-STD-1797A, Flying Qualities of Piloted Aircraft.
5. Systems Textbook , Chapter 3, "Human Factors."
6. Flight Manuals and related publications.
7. TPS textbooks.
8. Every MIL-STD ever written.

PURPOSE:

1. To broaden the student test pilot/FTE/N's experience base by qualitatively evaluating an aircraft and its systems.

2. To apply and practice curriculum flight test techniques in a variety of aircraft and thereby increase the students understanding of the techniques.

AIRCRAFT:

To be determined by available resources.

GENERAL:

1. Students will be designated to fly qual eval flights in aircraft with which they have little or no prior experience. Certain aircraft (or aircraft systems) will be evaluated by every student in the class, while others may be flown by only a limited number of students. Student preferences are considered in aircraft selection.

2. In most cases, flights will be conducted with IPs not assigned to the USAF TPS. In fact, generally the IP will be from another command, service, or agency (ACC, AMC, ANG, USN, NASA, etc.). For this reason, the flight preparation and professional attitude displayed by the student will not only determine the success of the qual eval but will also determine how "we," the TPS, are judged by the rest of the flying community.

3. The qual eval should place greatest emphasis on the aircraft's ability to perform its design mission. The aircraft should be investigated for basic performance and flying qualities as they affect the mission suitability. The aircraft may be lacking in

some areas of MIL STD compliance, but do not dwell on these unless they adversely effect safety or compromise the mission suitability.

4. Related aircraft systems should be evaluated from the standpoint of integration with the basic aircraft, function, use, interpretation, failure states, and enhancement of overall mission suitability. Be careful of attempting to evaluate too many systems in-flight. The simulator (if available) provides a good tool for this type of evaluation. Too many aviators waste a lot of time and fuel playing with a complicated system they don't understand and miss many other experiences they could have gained in performance or flying qualities investigations. Don't forget to look at the systems, but be sure you know how to operate them before you're turning dinosaurs into smoke and noise.

LIMITATIONS:
See Section II of this manual.

MISSION EVENTS:
1. Test points will be from an approved test plan for Formal Quals. See Section III of this manual for test plan details and test card sign-off. A thorough set of qual eval data cards is critical to any qual eval. The IP signs your test card and hence approves your test points.

2. Be prepared to brief the mission IP in detail. Make sure the IP is aware of exactly what is going to happen and in what sequence. You may request the IP to demonstrate some maneuver(s) in the aircraft. The IP has final say at all times.

INSTRUMENTATION:
Instrumentation will be as required and available. Normally, no special instrumentation will be used; however, a tape recorder, stopwatch, hand-held force gauge, etc. could be used. Hand-held data collection skills are valuable in any test program. Use and refine them.

REPORTING:
1. For <u>all</u> qual flights, a detailed Initial/Daily Flight Test Report (AFSC Form 5314) will be completed.

2. If you are delinquent in submitting your reports you will not be scheduled for any further quals!

3. See Section III, Test Management Phase, Single Look Qual Eval Reports, in this guide for further details.

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TEST MANAGEMENT PROJECT DATA FLIGHTS (PILOTS,FTE/N)

REFERENCES:

1. "TPS Reports Requirements," (Test Management Phase Planning Guide, Section III).
2. Your Test Plan.
3. Applicable flight manuals and related publications.
4. Every MIL-STD ever written.
5. TPS textbooks.

PURPOSE:

To afford the student an opportunity to execute flight test in a realistic atmosphere to the maximum extent possible.

AIRCRAFT:

As directed by your test plan.

GENERAL:

1. These sorties are part of the execution of your test management project test plan. Limitations, mission events, instrumentation, and reporting requirements will be IAW your test plan. Normally, each pilot will receive at least 2 sorties in his test management project aircraft.

2. During the conduct of the test, specific daily requirements will be identified on a "Student Project Scheduling Forecast" worksheet (see Figure 4.1) and submitted to Scheduling, Operations Division, by Thursday at least six working days prior to the week concerned. These worksheets are available in the TPS scheduling division.

STUDENT PROJECT
SCHEDULING FORECAST
WEEK OF:

	A/C TYPE	INSTRUMENTATION	TIME	RANGE SUPPORT	COMMENTS
M					
O					
N					
T					
U					
E					
W					
E					
D					
T					
H					
U					
F					
R					
I					

REMARKS _____

_____

REQUESTED BY (GROUP) _____

PROJECT MANAGER _____

SCHEDULING OFFICER _____

FIGURE 4.1

APPENDIX A
GRADESHEETS

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USAF TEST PILOT SCHOOL
STUDENT MISSION CARD/GRADE SHEET

MISSION	CLASS	DATE
QUAL EVAL DEMO (P/FTE/N)		

STUDENT	INSTRUCTOR PILOT	AIRCRAFT TYPE/NO.	FLIGHT TIME	GRADE
		A-37		

MISSION EVENTS
1. MISSION PREPARATION
2. BRIEF
3. GROUND OPERATIONS
4. TASK EVALUATION (LIST)
A. TAKEOFF
B. CLIMB
C.
D.
E.
F.
G.
H.
I.
J.
K.
L.
M.
N.
O.
P.
5. TRAFFIC PATTERN/LANDING
A. STRAIGHT IN/TOUCH AND GO
B. CLOSED PATTERN
C. NORMAL TOUCH AND GO
D. SFO
E. NORMAL FULL STOP
6. POST FLIGHT OPERATIONS
7. DEBRIEF

Comment on the following areas. (Expand on any area that is particularly strong or below average/unsatisfactory.) Continue on reverse side if necessary.

MISSION PREPARATION

FLIGHT TEST TECHNIQUES/DATA PROCEDURES/AIRCRAFT HANDLING

AIRMANSHIP (PLANNING/SAFETY/PROCEDURAL KNOWLEDGE)

INSTRUCTOR PILOT	SECTION CHIEF	CHIEF, OPERATIONS BR

AFSC FORM 5228a, OCT 86 REPLACES AFFTC FORM 255, NOV 84, WHICH WILL BE USED. USAFTPS/ED . OVERPRINT DATE: DEC 92

ADDITIONAL COMMENTS

USAF TEST PILOT SCHOOL
STUDENT MISSION CARD/GRADE SHEET

MISSION	CLASS	DATE
QUAL EVAL DEMO (P/FTE/N)		

STUDENT	INSTRUCTOR PILOT	AIRCRAFT TYPE/NO.	FLIGHT TIME	GRADE
		F-16B		

MISSION EVENTS
1. MISSION PREPARATION
2. BRIEF
3. GROUND OPERATIONS
4. TASK EVALUATION (LIST)
A. TAKEOFF
B. CLIMB
C.
D.
E.
F.
G.
H.
I.
J.
K.
L.
M.
N.
O.
P.
5. TRAFFIC PATTERN/LANDING
A.
B.
C.
D.
E.
6. POST FLIGHT OPERATIONS
7. DEBRIEF

Comment on the following areas. (Expand on any area that is particularly strong or below average/unsatisfactory.) Continue on reverse side if necessary.

MISSION PREPARATION

FLIGHT TEST TECHNIQUES/DATA PROCEDURES/AIRCRAFT HANDLING

AIRMANSHIP (PLANNING/SAFETY/PROCEDURAL KNOWLEDGE)

INSTRUCTOR PILOT	SECTION CHIEF	CHIEF, OPERATIONS BR

AFSC FORM 5228a, OCT 86 REPLACES AFFTC FORM 255, NOV 84, WHICH WILL BE USED. USAFTPS/ED . OVERPRINT DATE: DEC 92

ADDITIONAL COMMENTS

SECTION V
SAFETY REVIEW BOARD DOCUMENTATION

NOTE: The following safety review of the Systems Phase Planning Guide covered all of the curriculum sorties which are now part of the Test Management Phase.

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TEST PROJECT SAFETY REVIEW

I. SAFETY REVIEW REQUEST

PROJECT TEST TITLE	PROJECT JON	PERFORMING AGENCY
USAF Test Pilot School Systems Phase	996TPS	USAF Test Pilot School

PROJECT MANAGER (Typed Name and Grade)	SIGNATURE	PHONE NUMBER	DATE
John A. Armor, Maj	John A. Armor	7-2348	5 Oct 90
UNIT SSO (Typed Name and Grade)	SIGNATURE	PHONE NUMBER	DATE
James M. Morgan, Maj	James M. Morgan	7-8037	5 Oct 90

II. SAFETY REVIEW BOARD ACTION

TEST STARTING DATE	TEST COMPLETION DATE	RISK LEVEL	CONTROL NUMBER
15 Oct 90		Low	90-59

III. SAFETY BOARD MEMBERS

NAME, GRADE AND TITLE	SIGNATURE	NAME, GRADE AND TITLE	SIGNATURE
Ralph L. Johnston, Jr., Maj AFFTC/SET	Ralph L. Johnston		
Ron K. Rosepink, Maj 6512 TS/DOF	Ronald K Rosepink		
Brian P. Young, Capt 6515 TS/DOB	Brian P. Young		
Paul Kirsten, Civ 6510 TW/DOEF	Paul W Kirsten		

IV. BRIEF DESCRIPTION AND JUSTIFICATION OF TEST *(Use Additional Sheets of Plain Bond Paper if Needed)*

1. Background: The Systems Phase of instruction is part of the formal training provided by the USAF Test Pilot School (TPS).

Test Item Description: Systems test techniques are taught in the T-38, A-37, F/RF-4, A-7 and the F-16. Additional training is given in CALSPAN'S NT-33 and NC-131 aircraft.

3. Test Objective: Teach student test pilots, flight test engineers and test navigators the priniciples and techniques used in testing aircraft systems.

4. Type of Tests to be Performed: Testing includes all aspects of an aircraft's RADAR, INS, HUD and electro-optics systems. Overall aircraft performance, flying qualities and systems are evaluated on one-time flights during qualitative evaluations. Variable stability flying qualities are investigated during the (con't)

V. FINAL COORDINATION AND APPROVAL

COORDINATING OFFICIAL		DATE	CONCUR		COMMENTS ADDED	
TYPED NAME, GRADE AND TITLE	SIGNATURE		YES	NO	YES	NO
ELTON T. POLLOCK, Colonel Commandant, USAFTPS	Elton T Pollock	11 Oct 90	X			X
TEST WING DEPUTY COMMANDER FOR OPERATIONS		19 Oct 90	X			X
6510 TEST WING COMMANDER APPROVE		22 Oct 90	✓			✓
AFFTC DIRECTOR OF SAFETY COORDINATE	Gordon L Hardie	16 OCT 90	✓			—
AFFTC VICE COMMANDER REVIEW		24 OCT 90	✓			✓
~~SIGNATURE OF AFFTC COMMANDER~~			APPROVED ☐ DISAPPROVED ☐			

Section IV (con't)

NT-33 HUD evaluation sortie. Propulsion, structural loads and asymmetric stores carriage flight test techniques are introduced.

5. Difference From Previous Test: This test package incorporates the F-16 in qualitative evaluation demonstrations and systems evaluations, complementing the similar A-37 and A-7 sorties. All other sorties remain the same or have been slightly modified without expanding the original test envelope.

6. Scope: Sixteen sortie types are described in the Systems Phase Planning Guide. Student test pilots will fly approximately 14 sorties while student FTE/N's will fly about 6. Additionally, qualitative evaluations will number 8-10 per student.

Section VI (con't)

c. All systems Phase syllabus flights will be conducted in accordance with (IAW) the applicable aircraft's flight manual, AFFTC 55-2, applicable aircraft guides and within local flying area (except for qualitative evaluation flights flown at other locations).

d. All flights will be conducted in accordance with the USAFTPS 51 series regulations/operating instructions.

e. Changes to the Systems Phase Planning Guide require approval of the TPS Commandant. The Commandant will determine which changes warrant coordination with AFFTC/SET. Major changes to the Phase Planning Guide will be via AFSC Form 5028b.

f. For missions involving air-to-air or air-to-ground events, the applicable portions of the air-to-air or air-to-ground rules of engagement (ROE), will be briefed before each mission. USAFTPS Operations division will ensure each school briefing room maintains current copies of the ROEs (AFSCR 55-7 ROE will be used).

g. The appropriate aircraft aircrew aid will be used for aerobatic maneuver parameters.

A-37:

a. No external stores will be carried on qual eval mission except for pylon wing tanks.

b. For stalls:

(1) No asymmetric fuel load (a maximum of 70 lbs difference in wing fuel reading).

(2) Recovery will be initiated when the pilot has a clear indication of a definite g brake or a rapid uncommanded angular motion, the aft stick stop having been reached and AOA not increasing, or sustained intolerable buffet.

(3) Recovery will be completed by 10,000 ft AGL.

(4) Ensure both engines advance together during recovery in order to prevent a yawing moment due to asymmetric thrust.

(5) Abrupt stalls and vertical stalls will be avoided.

(6) IP will brief spin recovery and engine rollback procedures.

c. Engine RPM will not be reduced below 65% at airspeeds below 150 KIAS above 15,000 ft MSL, except for engine rollback demo.

d. No intentional flight with an engine shutdown below 10,000 ft AGL.

e. External tanks will be empty prior to starting bombing events.

f. Minimum landing rolls will not be performed due to potential for hot brakes and blown tires. The flight manual min-run approach procedures may be flown up to touchdown point.

On Range Weapons Deliveries (A-37 and F-4 Weapons Delivery Familiarization):

a. External wing tanks will be dry (and a satisfactory rig/stab aug check will be accomplished on F-4 missions) prior to starting the first bombing event.

b. After two fouls, the crew will leave the range and RTB.

c. Minimum dive recovery altitudes and hung ordinace procedures will be IAW AFFTCR 55-2.

d. Minimum airspeed in bombing pattern is 180 KIAS for the A-37 and 300 KIAS for the F-4.

e. The mission will be flown on a conventional range, either single ship or as a flight of two.

f. A range officer must control the mission while on the controlled range. If SPORT acts as the RCO, the minimum altitude on the range is 1500 ft AGL.

g. At least one dry practice pass per event will be flown for familiarization prior to releasing the first bomb for that event.

F-16:

a. Engine limitations:

(1) The throttle will be checked in mil power for all extreme nose high (above 60 degrees) maneuvers where the airspeed is less than 250 KCAS.

(2) The afterburner will not be selected or advanced when above 20,000 ft MSL and below 250 KCAS.

b. Simulated intercept air maneuvers against targets of opportunity will be flown to the rear quadrant and will be terminated at 6000 ft.

c. Minimum landing rolls will not be performed due to potential for hot brakes and blown tires. The flight manual min-run approach procedures may be flown up to touchdown point.

d. F-16 Qualitiative Evaluation Familiarization flight will be flown in the clean configuration only. The Qualitative Evaluation Demonstration flight will not be flown with external stores except for centerline or wing fuel tanks and wing tip missiles.

A-7:

a. All student missions will chased by an A-7 IP. The mission will be aborted if satisfactory UHF or VHF communication cannot be maintained with chase IP.

b. A-7 ground school, open book, closed book, and egress training will be accomplished prior to the first flight.

c. A crosswind limit of 15 knots will be observed.

d. During near stall investigation recovery will be initiated at 20.5 units AOA or rudder pedal shaker, whichever occurs first.

e. Slow flight and near stall investigation will only be conducted with CONT AUG - OFF at a minimum of 15,000 ft AGL.

f. Near stall investigation and flight path stability testing will be done at an AOA not greater than 20.5 units or pedal shaker, whichever occurs first. Manual flight will be limited to 19 units. All other testing will be done at an AOA not to exceed 17.5 units (on speed indication).

g. Prior to flight the student will demonstrate to the IP a through knowledge of departure and spin recovery techniques, SFO procedures and air start procedures.

h. Test point will be terminated and appropriate recovery will be initiated when any indication of departure from controlled flight develops.

i. No mission will be flown with external stores on the aircraft except the DIGITAC aircraft with an inert 500 lb bomb (preferred) or an external empty tank to balance the DIGITAC pod.

j. The following maneuver restrictions apply:

(1) No aileron rolls in excess of 360 degrees.

(2) No aileron rolls initiated at less than 1.0 g.

(3) No rolls in excess of 180 degress during rolling pullout maneuvers or in the approach configuration.

(4) Limit sideslip angle to 12 degrees maximum.

k. No wing tanks will be installed on the Qualitative Evaluation Familiarization flight.

F-4:

a. Near stall investigation testing will not be accomplished below 15,000 ft AGL.

b. All testing will be done at an AOA of 20 units or less.

c. Test point will be terminated and appropriate recovery will be initiated at the first indication of departure from controlled flight.

d. A rig/stab aug check will be accomplished on all flights prior to high speed, high g, or high AOA maneuvers. The roll aug will be disengaged for any maneuvering test point exceeding 15 units AOA in the cruise configuration.

e. No emergency patterns will be flown for evaluation at normal traffic pattern altitude. Failure states may be evaluated at altitude consistent with test restrictions.

f. External wing tanks will be dry prior to starting bombing events.

Qual Aircraft:

a. All flight cards will be approved by both an IP current in the aircraft and a USAFTPS IP.

b. A TPS instructor will fly the first qual flight with each quest IP in non AFFTC aircraft at Edwards AFB (except when waived by the USAFTPS/DO) to accomplish the following:

(1) Provide a local area briefing/orientation including guidance on pattern entry and exit, VFR/MARSA operations within R2508 (Mid-air avoidance will be emphasized), complex boundaries, low level procedures, etc.

(2) Demonstrate and discuss the typical maneuvers and flight test techniques which the students will be interested in evaluating.

(3) Brief the qual aircraft aircrew on USAFTPSR 51-9, Qualitative Evaluation Program.

c. No formation takeoffs or landings will be flown by students.

d. No BFM/ACBT will be flown. Structured air-to-air tracking tasks may be accomplished.

NT-33:

a. CALSPAN IP will be at the rear set of controls.

b. All demonstrations will be conducted under DAV VMC.

c. Simulated instrument approaches, using the blue/amber color filters, will be flown no lower than 200 ft AGL at which point: (a) a missed approach will be flown by the subject pilot; (b) the subject will raise the blue visor and complete the landing; or (c) the IP will take control and either land or execute a missed approach.

d. All class II modifications are reviewed and approved by WRDC/FIGD.

ASTTA:

a. All flight operations are restricted to 500 ft AGL during day VMC operations and 2000 feet AGL during night VMC operations, except that night VMC operations may be conducted as low as 500 feet AGL on the ASTA II (night) missions. All IMC operations will be conducted under an IFR clearance.

b. The aircraft will be flown by fully qualified CALSPAN aircrews during all missions, and these aircrew members will perform primary safety observer duties during the systems evaluations.

c. Systems demonstrations and evaluations will be conducted under the direct supervision of an USAFTPS instructor.

d. All class II modifications are reviewed and approved by WRDC/FIGD.

4. RISK ASSESSMENT: The SRB recommends LOW RISK.

5. COORDINATION COMMENTS:

TEST HAZARD ANALYSIS (THA)	PAGE 1 OF ~~12~~ 13 PAGES
TEST SERIES USAF Test Pilot School Systems Phase	HAZ CAT/PROBABILITY I/LOW
PREPARED BY (Type Name and Title) John A. Armor, Major	SIGNATURE John A. Armor
UNIT SSO (Type Name and Grade) James M. Morgan, Major	SIGNATURE James M. Morgan

HAZARD: F-4 dual engine failure during Propulsion Demo

CAUSE: 1. Mis-rigged engines
2. Engines/compressor stall due to FOD

EFFECT: Loss of aircraft/crew

MINIMIZING PROCEDURES:

1. (1,2) Rapid throttle transients are accomplished one engine at a time.
2. (1,2) If any engine anomaly is observed during profile, mission will be terminated.
3. (1) Only left engine will be intentionally shutdown at any time.
4. (1) RAT (RF-4C, F-4C/D) will be extended prior to shutting down an engine.
5. (1) Electrical system will be checked for proper bus-tie operation prior to shutting down an engine.

CORRECTIVE ACTION: If dual engine failure occurs, restart procedures will be accomplished IAW the flight manual. Mission will be terminated.

TEST HAZARD ANALYSIS (THA)	PAGE 2 OF 12 PAGES
TEST SERIES: USAF Test Pilot School System Phase	HAZ CAT/PROBABILITY: I/LOW
PREPARED BY (Type Name and Title): John A. Armor, Major	SIGNATURE: John A. Armor
UNIT SSO (Type Name and Grade): James M. Morgan, Major	SIGNATURE: James M. Morgan

HAZARD: Departure from Controlled Flight During F-4 Asymmetric Stores Investigation

CAUSE: 1. Exceeding roll authority
2. Departure while maneuvering

EFFECT: Loss of aircraft/crew

MINIMIZING PROCEDURES:

1. (1,2) Maximum maneuvering AOA will be limited to 16 units with fuel in the asymmetric tank.
2. (1,2) The approach to stall investigation will be terminated at 20 unit AOA or 3/4 lateral stick travel, whichever occurs first. Approach speed for landing will be 17 units AOA or the AOA where full aileron trim is required to maintain wings level, whichever is the lower AOA, until all the fuel is transferred from the tank.
3. (1) Maximum speed for high speed investigation will be 1.3 Mach or speed requiring 3/4 lateral stick travel for straight and level flight which ever occurs first.
4. (1) Maximum crosswind for takeoff and landing will be 10 knots from the side opposite the store and 18 knots from the side with the store with fuel in the asymmetric tank.
5. (2) Pitch and yaw stab augs and the appropriate external wing transfer light must be operable. The roll aug will be off during stall investigation.
6. (1,2) Simulated single engine approaches will be practiced at altitude.
7. (2) Aircraft must have an operable AOA gauge in the rear cockpit.
8. (1,2) This flight will be conducted under the direct supervision of a current and qualified instructor pilot.
9. All data points will be performed at or above 15,000 ft AGL when above 12 units AOA except takeoff and landing and controllability check.

CORRECTIVE ACTION: Abort procedures will be flown IAW the flight manual.

TEST HAZARD ANALYSIS (THA)	PAGE 3 OF 12 PAGES 13	
TEST SERIES USAF Test Pilot School Systems Phase		HAZ CAT/PROBABILITY II/LOW
PREPARED BY (Type Name and Title) John A. Arnor, Major	SIGNATURE	
UNIT SSO (Type Name and Grade) James M. Morgan, Major	SIGNATURE	

HAZARD: Aircraft Overstress During Structures Flight Test Techniques

CAUSE:
1. Lack of pilot proficiency
2. Inattention to accelerometer
3. Roll coupling

EFFECT: Damage to Aircraft

MINIMIZING PROCEDURES:

1. (1) All practice of structures flight test techniques will be under the direct supervision of a TPS instructor.
2. (1,2,3) The g limits for the F-4 Structures Demo will be +5 to -1 symmetric and +4 to +0.2 unsymmetric.
3. (1,2,3) The g limits for the F-4 Asymmetric Stores Demo will be +4 to -1 symmetric and +3 to +0.2 unsymmetric.
4. (1) a buildup from 80% of the above limits will be accomplished prior to 100%.

CORRECTIVE ACTION: If an overstress occurs a controllability check will be accomplished and the mission will be terminated.

TEST HAZARD ANALYSIS (THA)	PAGE 4 OF 13 PAGES
TEST SERIES: USAF Test Pilot School Systems Phase	HAZ CAT/PROBABILITY: I/LOW
PREPARED BY (Type Name and Title): John A. Armor, Major	SIGNATURE
UNIT SSO (Type Name and Grade): James M. Morgan, Major	SIGNATURE

HAZARD: G-Induced Loss of Consciousness (GLOC)

CAUSE: 1. G onset rate is too high
2. Improper straining maneuver is being used

EFFECT Damage/Loss of Aircraft and crew

MINIMIZING PROCEDURES:

1. (1,2) The aircrew will comply with USAFTPS OI 60-7 which will be briefed during the Qual Eval Demo FTT.
2. (1,2) An IP will be on-board for each flight where G loading is anticipated to be greater than 6.5 G's (5 G's for non-G suit aircraft).
3. (2) An IP will brief and demonstrate the proper straining maneuver.
4. (2) An IP will monitor student straining maneuver.

CORRECTIVE ACTION: If GLOC occurs, mission will be terminated.

TEST SERIES	HAZ CAT/PROBABILITY
USAF Test Pilot School Systems Phase	I/LOW

PREPARED BY (Type Name and Title)	SIGNATURE
John A. Armor, Major	John A. Armor
UNIT SSO (Type Name and Grade) James M. Morgan, Major	SIGNATURE James M Morgan

HAZARD: Ground impact during low level and practice off range weapon deliveries

CAUSE:
1. Pilot inattention
2. Visual illusion/misjudgment
3. Pilot task saturation/distraction

EFFECT: Damage/Loss of aircraft and crew

MINIMIZING PROCEDURES:

1. (1,2,3) An IP will be on board each flight/chase all A-7 student flights.
2. (1,2,3) An IP will brief and demonstrate the proper weapons delivery techniques prior to student practice.
3. (1,2,3) Simulated release altitudes must be adjusted so as not to descent below the specified minimum altitudes during the dive recovery.
4. A-37
   a. (1,2,3) Low level navigation and simulated dive bomb, rocket and strafe passes will be limited as follows:
      (1) No straight ahead attacks below 5000 ft AGL.
      (2) Maximum dive angle is 45.°
      (3) Minimum altitude for low level flight is 500 ft AGL.
      (4) Minimum altitudes for dive attacks:

Dive Angle	Minimum Altitude (AGL)
0-14	500 ft
15-24	1,000 ft
25-45	1,500 ft

5. F-16
   a. (1,2,3) Low level ride assessment will be flown on an approved low level route. Minimum altitude is 500 ft AGL. Minimum airspeed is 400 KCAS. Maximum airspeed is 450 KCAS.
   b. (1,2,3) Simulated weapons delivery restrictions:
      (1) Maximum dive angle is 45°.
      (2) Minimum altitudes for dive attacks:

Dive Angle	Minimum Altitude (AGL)
0-14	500 ft
15-24	1,000 ft
25-45	1,500 ft

TEST HAZARD ANALYSIS (THA)	PAGE 6 OF 12 PAGES (13)
TEST SERIES: USAF Test Pilot School Systems Phase	HAZ CAT/PROBABILITY: I/LOW
PREPARED BY (Type Name and Title): John A. Armor, Major	SIGNATURE: John A. Armor
UNIT SSO (Type Name and Grade): James M. Morgan, Major	SIGNATURE: James M. Morgan

HAZARD: Midair Collision

CAUSE:
1. Lack of clearing
2. High density traffic in VFR environment
3. Inability for front seat pilot to clear due to vision restriction device (NT-33)

EFFECT: Damage/Loss of aircraft and crew

MINIMIZING PROCEDURES:

1. (1,2) Midair Collision avoidance will be briefed prior to each sortie. One crewmember will be responsible for clearing during each phase of the mission.
2. (1,2) Students will receive midair hazard brief as art of their local area orientation.
3. (1,2) Qual aircrews will receive a midair hazard brief as part of their local area orientation.
4. (1,2) Crews will terminate all test maneuvers when traffic is called within 3 miles laterally and 5000 ft vertically if the traffic is not in sight.
5. (3) If traffic conflict appears eminent, the blue visor will be raised.

TEST HAZARD ANALYSIS (THA)

TEST SERIES: USAF Test Pilot School Systems Phase	HAZ CAT/PROBABILITY: I/LOW
PREPARED BY (Type Name and Title): John A. Armor, Major	SIGNATURE:
UNIT SSO (Type Name and Grade): James M. Morgan, Major	SIGNATURE:

HAZARD: Exceeding Aircraft Structural/Systems Limits During Qualitative Evaluation Flights (Non TPS Aircraft)

CAUSE: Unfamiliarity with aircraft/handling characteristics.

EFFECT: 1. Damage to aircraft/systems
2. Loss of aircraft and crew

MINIMIZING PROCEDURES:

1. The person flying the qualitative evaluation (qual eval) will receive ground training, cockpit time, and a thorough preflight briefing.

a. For dual place aircraft:
(1) Ground training will cover all systems essential to flight.
(2) Cockpit familiarization time, and when available, simulator time will be accomplished prior to flight.
(3) Preflight briefing will include applicable normal and emergency in-flight procedures.

b. For single place aircraft:
(1) A minimum of 8 hours of ground school covering all systems essential for flight will be accomplished.
(2) A minimum of 1 hour of cockpit time or simulator time will be accomplished.
(3) Open, closed, and bold face exams will be satisfactorily completed.
(4) Flights will be conducted within 30 days of the training or refresher training will be required.
(5) Preflight briefings will include applicable normal and emergency procedures.
(6) Students will demonstrate satisfactory aircraft knowledge to the qual aircraft instructor prior to flight. IPs may use any means they desire to determine if the student is prepared.

2. A TPS instructor will fly the first qual eval (unless the requirement is waived by the USAFTPS/DO) to show the qual aircraft aircrew the types of maneuvers and flight test techniques the students will want to accomplish. Specific aircraft limitations will be discussed for each of the maneuvers.

3. All maneuvers will be limited to 90% of the aircraft g limit and 95% of the aircraft airspeed limit.

4. Operational maneuvers which are limited by MAJCOM to highly experienced aircrews will not be flown by TPS students but may be demonstrated by the qual aircraft IP.

5. An IP current in the aircraft will be at one set of controls anytime a TPS student is flying (for A-6 flights, an IP may occupy the right seat).

6. FTE/N are not authorized to be on the controls during takeoffs and landings (below 300 ft), formation flying, or aerial refueling.

7. All flight cards will be approved by both an IP current in the aircraft and a USAFTPS IP.

TEST HAZARD ANALYSIS (THA)	PAGE 8 OF 12 PAGES	
TEST SERIES USAF Test Pilot School Systems Phase		HAZ CAT/PROBABILITY I/LOW
PREPARED BY (Type Name and Title) John A. Armor, Major	SIGNATURE John A. Armor	
UNIT SSO (Type Name and Grade) James M. Morgan, Major	SIGNATURE James M. Morgan	

HAZARD: Decompression Sickness During Propulsion Demo

CAUSE:
1. Loss of cabin pressurization due to dual engine failure
2. Loss of cabin pressurization due to poor canopy pressurization seals

EFFECT: Injury of aircrew/loss of life

MINIMIZING PROCEDURES:

1. (1) Rapid throttle transients are accomplished one engine at a time.
2. (2) Cabin pressure is monitored during test points and engine shutdown to ensure pressurization remains on or below normal schedule and below 25,000 ft.
3. (2) All throttle transients will be done with the right engine after the left engine is placed at 80% RPM to maintain sufficient bleed air for good cockpit pressurization.

CORRECTIVE ACTION: If cabin pressurization climbs above 25,000 ft, mission is terminated and a physiological incident will be declared.

REMARKS:

1. Normal cabin pressure at the 50,000 ft point is planned to be 22,000 ± 1,000 ft.
2. Aircrew will breath 100% Oxygen from engine start through the last airstart.

TEST HAZARD ANALYSIS (THA)	PAGE 9 OF 12 13
TEST SERIES USAF Test Pilot School Systems Phase	HAZ CAT/PROBABILITY I/LOW
PREPARED BY (Type Name and Title) JOHN A. ARMOR, Major	SIGNATURE
UNIT SSO (Type Name and Grade) JAMES M. MORGAN, Major	SIGNATURE

HAZARD: Uncontrolled Oscillations in Landing Phase (NT-33)

CAUSE: 1. Variable stability system malfunction.
2. Pilot induced oscillations.

EFFECT: Damage/loss of aircraft and crew

MINIMIZING PROCEDURES:

1. (2) Landings performed using a fixed (no-motion) control stick will be preceded by a landing of the same configuration with a moving stick.

2. (1) The safety pilot will be a CALSPAN IP.

3. (1,2) The safety pilot will take over control if any of the following situations exist at the 50 feet AGL point:

   a. Airspeed decreasing and more than 5 kts below recommended approach speed.

   b. Excessive sink rate developing

   c. Any sign of a PIO with "g" excursions beyond $\pm$ 0.2g.

   d. Rapid nose down pitch changes.

4. No touch-and-go's with the vision-restriction visor.

5. Configurations proven to PIO will not be flown with fuel in tiptanks.

TEST HAZARD ANALYSIS (THA)	HAZ CAT/PROBABILITY
TEST SERIES: USAF Test Pilot School Systems Phase	II/LOW

PREPARED BY (Type Name and Title)	SIGNATURE
JOHN A. ARMOR, Major	John A. Armor
UNIT SSO (Type Name and Grade)	SIGNATURE
JAMES M. MORGAN, Major	James M. Morgan

HAZARD: Inadvertent Radiation of Ground Personnel (ASTTA)

CAUSE: Inadvertent intrusion of ground personnel while radar is transmitting

EFFECT: Injury to personnel

MINIMIZING PROCEDURES:

1. All flight and maintenance personnel will be briefed on proper use of equipment and hazards of radiation.

2. Checklists will provide procedures to prevent inadvertent turn-on of equipment.

3. Danger zone will be marked at parking spot and monitored by a safety observer.

4. Aircraft strobes will be illuminated when intentionally radiating.

CORRECTIVE ACTION: If personnel enter danger area, radar will be shutdown.

REMARKS: Danger zone is $\pm$ 70° of nose within 75 feet. Squat switch override is a red guarded toggle itch.

TEST HAZARD ANALYSIS (THA)	PAGE 11 OF 17 PAGE(S)
TEST SERIES: USAF Test Pilot School Systems Phase	HAZ CAT/PROBABILITY: I/LOW
PREPARED BY (Type Name and Title): JOHN A. ARMOR, Major	SIGNATURE: John A. Armor
UNIT SSO (Type Name and Grade): JAMES M. MORGAN, Major	SIGNATURE: James M. Morgan

HAZARD: Ground Impact During Night ASTTA

CAUSE: 1. Aircrew Inattention
2. Improper ground track

EFFECTS: Loss of aircraft and crew

MINIMIZING PROCEDURES:

1. (1,2) All night operations will be at 2000 feet AGL minimum except run-ins to the IR board.

2. (1,2) All operations will be conducted in VMC.

3. (1,2) The following restrictions apply to run-ins to the IR board.

   a. The ASTTA front cockpit will have an operable radar altimeter.

   b. Missions will be under SPORT control.

   c. Descent to 500 feet AGL minimum will only be on a eastbound run-in to the IR board and within the PIRA/Alpha corridor.

   d. A positive means will be used to align final run-in to be perpendicular to the IR board.

   e. A climb to 2000 feet AGL will be accomplished immediately after crossing over the IR board.

REMARK: Currently, LORAN is used to align final flight path perpendicular to the IR board. Also, a vehicle is parked near the IR board with its headlights illuminated in the direction of the run-in to aid in visual identification.

TEST HAZARD ANALYSIS (THA)	PAGE 12 OF 13 PAGES
TEST SERIES: USAF Test Pilot School Systems Phase	HAZ CAT/PROBABILITY: I/LOW
PREPARED BY (Type Name and Title): JOHN A. ARMOR, Major	SIGNATURE: John A. Armor
UNIT SSO (Type Name and Grade): JAMES M. MORGAN, Major	SIGNATURE: James M. Morgan

HAZARD: Bird Strike on Test or Chase Aircraft

CAUSES: 1. Low altitude flight
2. Flight in areas of known bird congregation

EFFECT: Damage and/or loss of aircraft and aircrew

MINIMIZING PROCEDURES:

1. (1) Aircrews will fly with visors down at all times during low level flights.

2. (2) Aircrews will avoid areas of known bird congregation (evaporating pools).

3. (1,2) Bird strike contingency plans will be a preflight briefing item.

4. (1,2) Mission planning for low altitude points will include Bird Air Strike Hazard (BASH) analysis (if available) provided by Flying Safety. Low level flying will avoid ± one hour of sunrise or sunset when bird activity is expected to be high.

CORRECTIVE ACTION:

1. If the bird strike is observed or is suspected, the aircraft will climb to a safe altitude and the mission will be terminated.

REMARKS:

The NC-131 aircraft may operate within ± hour of sunset/sunrise near the evaporating ponds due to mission requirements. The radome was designed to take a hit by a bird the size of a Canadian goose at normal operational speeds.

TEST HAZARD ANALYSIS (THA)		PAGE 13 OF 13 PAGE(S)
TEST SERIES USAF Test Pilot School		HAZ CAT/PROBABILITY 1/LOW
PREPARED BY (Type Name and Title) John A. Armor, Major	SIGNATURE John A. Armor	
UNIT SSO (Type Name and Grade) James M. Morgan, Major	SIGNATURE James M. Morgan	

HAZARD: Mid-air collision between test aircraft and target aircraft

CAUSE: 1. Failure to see and avoid
2. Loss of situational awareness between test and target aircraft

EFFECT: Damage and or loss of aircraft and crew

MINIMIZING PROCEDURES:

1. (1,2) Aircraft will maintain 1000 feet altitude separation inside of 10 miles unless visual contact is maintained between the aircraft.
2. (1,2) Aircraft will maintain a 1000 foot safety bubble except for standard departure, fingertip, close trail, or rejoins which will be prebriefed.
3. (2) Detailed profile and procedures briefings will be conducted with target pilots.
4. (2) Sport will be utilized if available.

TEST EI TPS SYSTEM PHASE DATE: 10+18 SEPT 0

NAME/RANK OR GRADE	ORGANIZATION	TELEPHONE	SRB FUNCTION
MAJ JOHNSTON JR RALPH L	AFFTC/SET	7-3217	CHAIRMAN
MAJ SASSCER Roland M.	USAFTPS/STT	7-4565	
MAJ ARMER, JOHN A.	USAFTPS/STS	7-2348	SYSTEMS PHASE CHIEF
MAJ [illegible], JIM	USAFTPS/DOD	7-8037	UTSO
MAJ ROGERS, RON K	6512 TS/DOF	7-3240	MEMBER
CAPT YOUNG, BRIAN P.	6515 TS/DOB	7-4186	MEMBER
PAUL KIRSTEN GM-14	6510 TW/DOEF	7-1240	MEMBER
John Ball CIV	CALSPAN	716-631-6966	CALSPAN REP
LTC Howard Lewis	USAFTPS/DO	7-8037	TPS PROJECT PILOT - F-4, A-7
MAJ Dan Isbell	USAFTPS/STT	7-4565	TPS PROJECT PILOT - A-37

ATTACH 1